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Demographic change in coastal fishing communities and its implications for the coastal environment

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by
U. Tietze
FAO Fisheries Department
G. Groenewold
Netherlands Interdisciplinary Demographic Institute (NiDi)
and
A. Marcoux
FAO Sustainable Development Department

Food and Agriculture Organization of the United Nations

Rome, 2000

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PREPARATION OF THIS DOCUMENT

The document has been written by Messrs Uwe Tietze and Alain Marcoux, respectively of the Fisheries Department and Sustainable Development Department of FAO, Rome, and by Mr George Groenewold of the Netherlands Interdisciplinary Demographic Institute. Ms Penny Brown edited the text. The document summarizes the findings of an interregional study carried out by the UNFPA-funded, FAO-executed project "Strengthening of research and training on population and development dynamics of rural fishing communities". It is based on country research reports prepared by the Project teams in the Philippines, Malaysia, Bangladesh, India, Tanzania and Senegal, and on supplementary analysis of survey data.

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Cover: fisherfolk in the Philippines.

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ABSTRACT

Increase in the number of fishers as a result of population growth and migration to coastal fishing communities can be a contributing factor in the overexploitation of local fisheries resources and deterioration of the coastal environment. Better understanding the demographic and social dynamics of coastal fishing communities will help develop policies to achieve a sustainable use and conservation of fisheries resources and the coastal environment. Contributing to that effort was the goal of a UNFPA-FAO project, "Strengthening of research and training on population and development dynamics of rural fishing communities".

Contrary to the assumed global trend, the number of coastal fishers has started to decline or stagnate in four of the countries studied, while it is still increasing, although more slowly, in the other two. Also contrary to other reports, levels of fertility and infant mortality in fishing communities were found not to be much higher than those in farming communities. However, adult mortality data seem to indicating that living and health conditions in fishing communities could be worse than average, in particular for women.

The investigations into occupational change within and between generations suggest that artisanal fisheries no longer are a "last resort employment" for people in some coastal areas. Artisanal fisheries are one of a number of income-earning opportunities, including some outside the fisheries sector. In a number of countries, government policies aim at a reduction or limitation of fishing effort and at conservation or rehabilitation of fisheries resources. Such policies affect the options of households in coastal areas regarding income opportunities. Such policies may force fisherfolk households out of their traditional main occupation.

Fisherfolk are generally aware of the decline of fisheries resources and the deterioration of the coastal environment. They are also aware that an increase in their numbers has contributed to the present state of affairs, together with the intrusion of industrial fisheries in coastal waters and with industrial pollution. Fisherfolk in the villages studied see an urgent need to introduce effective policies and measures for the management and conservation of fisheries resources and coastal environment and are keen to participate in their implementation.

A transition in attitudes regarding both family formation and future livelihoods is visible among the younger generations. A modernization of marriage and fertility norms is under way. As for fisheries, like farming they are no longer seen as a promising long-term option.

In a policy perspective, needs for proper information on sociodemographic characteristics and trends were identified to enable designing more relevant interventions both in the fisheries domain and in the population one.

Project findings will be used at country level to enrich training in fisheries policy analysis with topics related to population dimensions and relevant information and materials.

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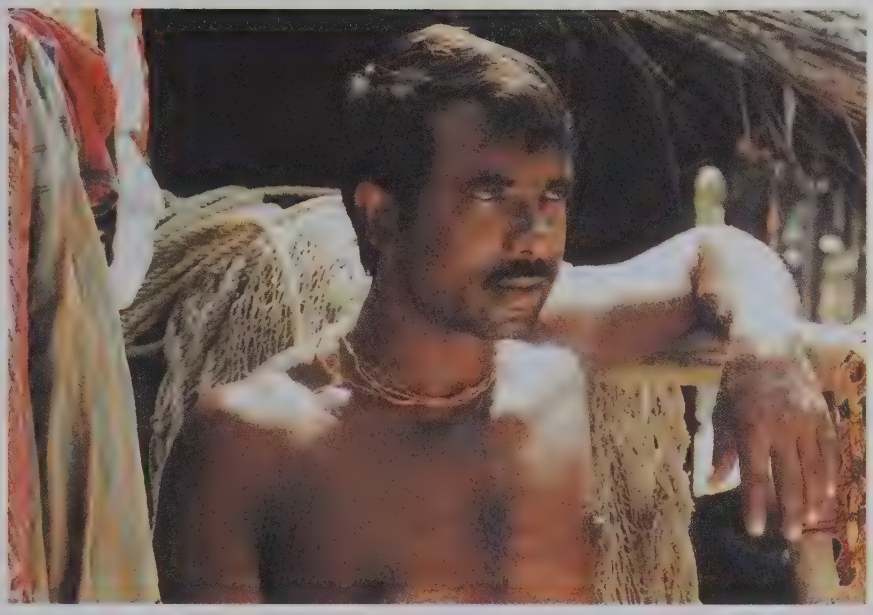
Fisherfolk in Bagamoyo District, Tanzania

Fisherfolk in Bagamoyo District, Tanzania



Fisherfolk of Bangladesh

Fisherfolk of Bangladesh

1. BACKGROUND AND OBJECTIVES OF STUDY

By U. Tietze and G. Groenewold

Introduction – The problem

Globally, the number of fishers in coastal areas has considerably increased over the last two decades. This is commonly considered a contributing factor in the overexploitation of marine fisheries resources and the deterioration of the coastal environment. This happened while the fertility and growth rates of the general population were declining in many countries. The factors of the particular dynamics of fishing populations – natural population growth, migration to coastal fishing communities, occupational mobility – therefore deserve attention.

Not much is known, however, about demographic or labour use trends in fishing communities and their causes. Even less is known about the interaction of those trends with the state of the coastal environment and fisheries resources, or about their relative significance vis-à-vis industrial pollution, large-scale fishing operations, commercial coastal aquaculture, etc. Little is also understood of the social and economic welfare of coastal fishing communities, recent change, the perceptions fisherfolk have of interactions between their own communities, fisheries resources, the coastal environment, and what has occurred over past generations. Yet, unless demographic and social transition in coastal fishing communities and its implications for the social and economic welfare of fisherfolk are properly understood and considered in fishery planning, development and management, it is unlikely that sustainable use and conservation of fisheries resources and the coastal environment can be achieved.

In the mid-1980s, expert and working group meetings on artisanal fisheries organized by FAO and the World Bank noted that fisheries administrations and research institutions had given much attention to data collection on fish stocks, catch, vessels, fishing gear etc., while the acquisition of socioeconomic and demographic data on fishers has been neglected. The lack of such information has been one of the most serious impediments to effective policy-making and planning to improve living conditions in communities where a major part of the households earned their income directly or indirectly from artisanal fisheries. A desk study carried out in the preparatory phase of this project confirmed the above conclusions: population and development research on artisanal fisherfolk and fishing communities is deficient and incidental (Groenewold, 1994).

In spite of the lack of empirical data and of regional differences, a general characterization of marine artisanal fishing communities – in terms of technological, sociological, economic criteria – can be made. In technological terms, marine artisanal and small-scale fisheries are characterized in most cases by fishing craft with non-mechanized propulsion systems (sails and oars) or low-horsepower outboard or inboard engines; use of passive fishing methods; manual operation of fishing gear (setting, shooting and hauling) and the absence of electronic fish-finding and navigational devices.

In sociological terms, a characterization of artisanal fisherfolk includes: participation of kin group members, as owners of craft and gear, in occupational work groups; professional socialization and training within kin groups rather than in specialized formal institutions; integration of workplace and habitation; and profession-specific settlements.

In economic terms, artisanal marine fisheries are characterized by: low and irregular incomes; special arrangements for compensation of labour and capital inputs, with a prevalence of sharing systems rather than fixed wages; labour-intensive rather than capital-intensive methods of

production; exploitation of open-access resources, in competition with industrial fisheries. Moreover, fishing communities tend to have low standards of living in terms of access to safe drinking water, housing conditions and health and family planning services. Frequently, nutritional, health and hygienic standards are poor. They often lack adequate infrastructure and community services such as all-weather roads and public transport, as well as access to credit and other support services, including storage/preservation, processing and marketing facilities.

In general, coastal fishing communities tend to be traditional-minded, homogeneous and rather isolated, and are categorized as belonging to the poorest of rural dwellers. In some areas, outsiders tend to perceive fishing as a low status profession. In their belief and value system, superstition, rites and folklore play an important role, and this may have an effect on their reproductive and health behaviour. In some geographical areas, households in fishing communities seem to have higher fertility rates compared to nearby farming communities; in other areas, no differences were observed. Poor nutritional conditions and high levels of morbidity have often been observed, especially among children. These phenomena vary over time, in particular according to the fishing season.

The Project

The studies presented in this publication were carried out within the framework of the UNFPA-funded, FAO-executed project "Strengthening of research and training on population and development dynamics of rural fishing communities", henceforth referred to as the Project.

The Project addressed the need for greater awareness among fisheries policy makers, scientists, non-governmental organizations (NGOs), fisher associations and others of relevance to human population issues for the development of fisheries, management and planning. Micro- and macro-level surveys were carried out to improve the understanding of the sociodemographic characteristics of fisherfolk, their perceptions of and relationship to population factors, the level of exploitation of fisheries resources and the state of the coastal environment. The Project strategy was to support a small group of national experts in the incorporation of population concerns into ongoing or new fisheries research and educational programmes, and to ultimately link both to practical field level fisheries development and management. To implement this approach, six research and training institutions, representing four sub-regions in Asia and Africa, namely West Africa, East Africa, South Asia and Southeast Asia were identified during the preparatory phase of the Project.

The said institutions were:

- the University of the Philippines in the Visayas, College of Fisheries
- the Universiti Pertanian Malaysia, Department of Natural Resource Economics
- the Central Institute of Fisheries Education, Mumbai, India
- the Bangladesh Academy for Rural Development
- the University of Dar-Es-Salaam, Department of Sociology
- the Direction Statistique, Senegal

During the preparatory phase, a desk study of literature on socioeconomic and demographic characteristics of fishing communities was undertaken. National fisheries development programmes were reviewed regarding their incorporation of population and development issues. Next, a mission to the participating research and educational/training institutions was undertaken. Curricula for training and educational/academic programmes were analysed, and an assessment was made of needs and the capacity of concerned institutes to integrate a population and development perspective into their work. The preparatory phase of the Project ended with an interregional

workshop held in January 1994, in Dhaka, Bangladesh where a work plan for the main phase of the Project was prepared.

The main phase of the Project was initiated in 1995. The participating institutions served as focal points for the design and completion of research on rural artisanal fisherfolk and subsequent educational activities. Fisheries administrations and development agencies were also associated with these research and training activities.

In each collaborating country, the main phase was carried out by a small interdisciplinary task force consisting of two local consultants and a full-time national project director (NPD), along with resource people. The teams were supported by an international consultant provided The Netherlands Interdisciplinary Demographic Institute (NiDi) in The Hague and an FAO/HQ project coordinator.

During the main phase, the Project provided support to the institutes through provision of technical advice on research strategies, methods and instruments, curriculum development, funding of research activities and on the organization of national and regional workshops.

During the field research stage, various types of research activities were accomplished. These included national macro-level studies on the population and the demographic characteristics of fishing communities. Micro-level studies, i.e. focus group discussions and household sample surveys of fisherfolk in selected regions were also carried out.

The field research also covered a comparison group of non-fisherfolk living in the same ecosystem. This helped to determine whether fisherfolk really live and behave differently than other rural dwellers, and whether they need special attention or different approaches in the design and implementation of population and development policies and programmes affecting rural areas.

The curriculum development activities incorporated the outcome of the previous two stages of the Project and involved the development of curricula and model training programmes for institutes, academic institutions, fisheries administrations, fisheries development agencies, fisher associations and NGOs in the sub-regions. Results of the research on fisherfolk were used both as input and as reference material for curriculum development and training programmes.

2. METHOD OF STUDY

By G. Groenewold and U. Tietze

Macro-level secondary data analysis

The macro-level secondary data analysis consisted of a comparison between the geographic distributions of fisherfolk at the time of the last three population or fisheries censuses to assess the change that had occurred in (a) the geographic distribution of fisherfolk and the number and type of fishing craft and gear, (b) the geographic distribution and fish catches/production, (c) the level of exploitation of aquatic resources in terms of "under exploited", "fully exploited" and "over exploited" and (d) the state of the coastal environment, including the level of water pollution, destruction of mangroves, etc. Regarding (c), reference was made to inshore and offshore as well as pelagic and demersal resources. It was assumed that the last three population or fisheries censuses would span a period of 20-30 years, depending on the year when the last census was carried out.

Based on the compilation and analysis of secondary data available from population or fisheries censuses and from key informants and experts, (e.g. information on the level of the exploitation of aquatic resources and on the state of the coastal environment), a comparison was made with reference to particular geographical areas within the country: whether and to what extent increases/decreases in the number of fisherfolk populations had affected (a), (b), (c) and (d) above.

Regarding the geographic areas to be distinguished, there was an attempt to consolidate data at the largest administrative unit level, i.e. the coastal State in India and Malaysia, the region in the Philippines, Tanzania and Senegal and the district in Bangladesh. In a particular state, region or district where the focus group discussions and the representative household survey were carried out later, it was attempted further disaggregate data at the next lower administrative level: the district in India, the province in the Philippines, etc.

In addition to the change in the number of fisherfolk, change in socioeconomic, health and demographic characteristics was described and documented. This included the following:

- total fertility rate (TFR) of women between 15 and 49 years;
- average number of children born to women between 15 and 49 years;
- average desired family size;
- contraceptive prevalence rates with regard to all methods as well as to modern methods;
- average age at first marriage;
- average age at birth of first child;
- infant mortality rate and child mortality rate;
- percentage of severely malnourished children below the age of four years;
- percentage of moderately malnourished children below the age of four years;
- average size of households;
- net migration rate by gender and if possible by broad age group;
- illiteracy rate by gender;
- female labour force participation;
- percentage of population working in agriculture, industry/manufacturing services;
- percentage of land area used for agriculture;
- average household income levels.

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[1] Infant mortality refers to deaths occuring between ages 0 to 12 months. Child mortality refers to those occuring between ages 0 to 5 years exactly (0-60 months).

The sources of data for socioeconomic, health and demographic characteristics and their development over the last three population censuses were: population and housing censuses, labour force and employment surveys, world fertility survey (WFS), demographic and health surveys (DSH) and contraceptive prevalence surveys (CPS).

With regard to the socioeconomic, health and demographic characteristics, there was an attempt to extract data for fisherfolk from the above-mentioned surveys in relation to the overall population. This was to be done at the same level as the compilation and comparison of the number of fisherfolk, e.g. at the state, regional and district level. If this was not feasible, it was to be done at the national level.

The overall objective of the macro-level secondary data analysis was to describe and document the extent and nature of the demographic, health and related socioeconomic transformation over the last 20-30 years in coastal fishing communities. This was to be related to the variation in the number and type of fishing technology, fish production, the level of exploitation of marine aquatic resources and the state of the coastal environment.

Focus group discussions

The focus group discussions were to compare the demographic, socioeconomic, health, production and environmental data and information compiled in the course of the macro-level secondary data analysis with the actual awareness, knowledge and perceptions of a selected fishing community. Subjective explanations and perceptions of objective trends and developments were thus provided by the groups, revealing what fisherfolk and non-fisherfolk perceived to be the demographic socioeconomic and environmental changes that had occurred in the past and were unfolding now.

In addition, the focus group discussions were to yield qualitative information on the attitudes of fisherfolk and non-fisherfolk towards human fertility, family size, family planning etc., in relation to the natural resource base. The discussions were also to examine concern for the level of exploitation of aquatic resources, the state of the coastal environment and other significant attitudes and perceptions. These include fisherfolk's and non-fisherfolk's views of developmental needs and constraints, personal ambitions and perspectives etc. (see Annex 4).

To understand whether and how occupation and environment influenced attitudes and views of fisherfolk, it was decided that a comparison would be needed with non-fisherfolk, that is, nearby farmers. Therefore, two villages were selected in a district where, later, a household survey was to be carried out.[2] One of the villages was a fisherfolk village, where the majority or all the households earn the major part or all income from fishing. The other village was inhabited by predominantly farmers and located near the fishing village. As the prime interest of the project is to learn about the lives of fisherfolk the number of topics covered in focus group meetings of fisherfolk was more comprehensive than in focus group meetings of farmers (see also: Annex 4)

The following subjects were dealt with in the focus group discussions:

- Awareness and understanding in fishing communities of the reasons for changes in (a) the geographic and demographic distribution of fisherfolk population and its socioeconomic status over the past 20 years; (b) the fish catch, the fishing technology and fish marketing over the past

[2] Throughout this document, the terms "village" and "community" will be used interchangeably, meaning the human settlements where the research took place. Thereforen no reference is intended to e.g. "village" as an administrative category, where applicable.

20 years, including production costs and income; (c) the level of exploitation of resources over the past 20 years; (d) the state of the coastal environment over the past 20 years.

- Perception in fishing communities of the relationship between changes in the geographic distribution of fisherfolk population and changes in: numbers and types of fishing gear; fish catches/production; level of exploitation of resources and the state of coastal environment.

Household survey

The household survey was the main field research activity carried out by the Project. It aimed to explore, describe and analyse demographic characteristics and cognitive patterns of marine fisherfolk with regard to human fertility rates, reproductive behaviour and other demographically relevant factors. The survey also aimed to further the understanding of the cognitive patterns and demographic characteristics of the natural environment in which fisherfolk live and make a living.

In order to support country teams with the design and implementation of household surveys, FAO produced and distributed a number of documents, as well as a software application to the staff of the country teams, including:

- questionnaires to obtain village-level information from key-informants and household information from heads of households and eligible household members;
- a software application[3] and instruction manual to process the completed household survey questionnaires in a standardized manner;
- guidelines to analyse data of the household survey and data collected from key village informants;
- guidelines to develop a probability sample design.

A set of household questionnaires was prepared by FAO and field-tested in the study areas by the country teams. A set consisted of one household level questionnaire and a number of individual questionnaires. The household questionnaire, answered by the head of the household, collected information on household composition and certain characteristics of household members, housing and living conditions, income, savings and debt, assets and comprehension of the local environment. The individual questionnaire, answered by each eligible household member, collected information on socio-demographic characteristics, production, reproduction and understanding of the local ecosystem. In general, the eligibility of household members for an individual interview was based on age and marital status selection criteria.

The survey questionnaires adopted the local definition of the household concept. A household was defined as a socioeconomic unit, irrespective of whether the household members were related by blood or marriage. Individuals belonged to a household if they were thus perceived by the head of the household, and if they formed a socioeconomic unit in terms of housing, generation and use of income and consumption. Despite the fact that the concept "head of household" has become controversial, the household survey maintained the use of that concept. It was accepted as such in the rural communities covered by the Project.

According to the guidelines, the household surveys in each country were to be carried out in the coastal fishing communities of a particular district or province where coastal fishing is considered to be an important livelihood. Where possible, probability sample designs were to be developed and implemented, making survey results statistically representative for all of the fishing communities in

[3] Based on the ISSA software (Integrated System for Survey Analysis) of the Institute of Resource Development at Macro International Inc., USA.

that district or province. It was proposed[4] to sample at least five fishing communities for a total of 100 households. Moreover, five farming communities and 100 households were to be sampled in the vicinity of the sampled fishing communities. Thus, in each country, the household survey collected information on about 100 fisherfolk households and about 100 farming households .

In two of the six countries studied, however, namely Bangladesh and Malaysia, sampling of fishing communities could not be carried out. Probability sampling of fishing communities proved problematic because there were only a limited number of agricultural communities located near fishing communities in Bangladesh. In the case of Malaysia, the advice of concerned Government authorities on the selection of fishing communities was sought.

Selection of sample

The Philippines

The household survey was carried out in five fishing villages (i.e. barangays) that were sampled from a sampling frame consisting of 22 fishing villages. All the villages belong to the municipality of Miag-ao, situated on the island province of the Visayas. Near each of the sampled fishing villages, a farming village was identified. All the selected villages were screened to determine the number, type and location of the households. In fishing villages, only fisherfolk households were identified, selected and interviewed. In farming villages, only farming households were identified, selected and interviewed. In each selected village 20 households were sampled. Fishing villages varied in size from 93 to 324 fisherfolk households. As the number of households sampled in each village was not in proportion to the population size of the village the computation of sample design weights was required and to be used in data analyses. Survey results from fisherfolk households are representative for fisherfolk households in all fishing villages of the municipality of Miag-ao. Survey results of farming households in farming communities are only representative for the particular village in which farming households are sampled and interviewed.

Malaysia

The household survey was carried out in five fishing and five farming villages in the northern part of the state of Kedah, near the Thai border on the West Coast of Peninsular Malaysia. The villages were selected according to the perceived responsiveness of villagers and the advice of the Fisheries Development Authority of Malaysia (LKIM) and the Agriculture Development Authority of Malaysia (MADA). Within each village, 20 households were selected. Enumerators were asked to pick a household in the village at random and interview it. In the case of absence or non-availability, a replacement household was identified and interviewed. As in Bangladesh, in fishing villages only fisherfolk households were considered eligible for interviewing and in farming villages, farming households only. Whereas in other countries all (married) women from 15 to 60 years and men from 15 to 64 were eligible for interviewing, because of budgetary constraints, only the head of household, his/her spouse, eldest son and/or daughter were considered eligible. Eventually, a total of 201 households were identified and interviewed. The survey results of sampled households were only representative for the particular village and for its household sub-population. The way villages and households were selected make that survey results cannot be generalized beyond the level of interviewed households.

[4] See Annex 3: Sampling guidelines.

Bangladesh

The household survey was carried out in villages selected in three districts along the south and southeastern coast of Bangladesh: Laxmipur, Chittagong and Noakhali. Poor road and transport infrastructure, as well as the difficult-to-meet condition set by the Project that the chosen agricultural village must be close to the chosen fishing village, were some of the main reasons why a probability sample of villages and households was not accomplished. Therefore, five fishing villages and five agricultural villages were selected by judgment. In each village, 20 households were selected and interviewed. In fishing villages, only fisherfolk households were listed, selected and interviewed. In agricultural villages, only farming households were listed, selected and interviewed. The selected villages appear to vary in size from 37 to 350 households. A total of 200 households were selected and all were successfully interviewed. The purposive selection of villages makes that findings from the household survey are only representative at the level of a selected village and the sub-population of households within that village.

India

The household survey was carried out in coastal villages in the Thane district, north of Bombay in the State of Maharashtra. It is estimated that about two million people live in the 1 682 villages of the district. In 82 of the villages, fisherfolk households were the predominant inhabitants. The idea was to develop a sample design that would generate representative survey data for all the fishing villages in Thane district. More specifically, from the list of 82 fishing villages, five fishing villages were randomly selected. Five farming villages were identified as the nearest to each of the five sampled fishing villages. A fixed number of 20 households were sampled within each of the villages (after the total number of households and their locations were determined). Because the population sizes of the villages varied, i.e. from 200 to 3 000 households, sample design weights were computed and applied in the analysis. The weights compensate for the fact that, due to the method used to sample unequal sized villages, data taken from households in small villages are over-represented in the database, whereas data from households in large villages are under-represented. Survey results are representative for all fishing villages in Thane district.

Tanzania

The household survey was carried out in the southern part of Bagamoyo district in the coastal region, north of Dar-Es-Salaam. Adequate and appropriate sampling frames were lacking on district and village levels. Moreover, road and transport infrastructure was so poor that the household survey was confined to one sub-district in the south of Bagamoyo district.

The sub-district consisted of six fishing and five farming villages. The goal was to develop a sample design that would make survey data from fishing villages representative for all the households in fishing villages in the sub-district. Two fishing villages were randomly sampled from the six villages in the sub-district. Farming villages were selected on the basis of how closely they were located to the sampled fishing villages. Independent from the aforementioned sampling, a third fishing village was sampled to pre-test the questionnaire. In the analysis, interviews obtained from the test population in this village were added to those of the other four villages, introducing sampling bias. The objective was to sample and interview a fixed percentage (10%) of households in each of the five villages, making the design a self-weighting one. A screening operation in the selected villages was carried out to determine the location and number of households. From the 2 423 households counted in the five villages, 242 households (10%) were sampled. Eventually, the eligible household members in 225 households were successfully contacted and interviewed, resulting in an enumeration response rate of 93 percent. Merging data from the test population with

data of the sampled population resulted in survey results that are, strictly speaking, not representative for the sub-district in Bagamoyo district.

Senegal

The household survey was carried out in communities located in three regions north of Dakar: Louga, Thiès and Saint-Louis. A probability sample design was developed to generate representative data for fishing and farming communities in the three regions. The recommended sample size of 200 households was increased to 500 households to enable, statistically speaking, more meaningful analysis and generalizations.

All the communities in the three regions were classified and grouped into the two strata of fishing and farming communities. The fishing communities consisted of 20 villages and 61 "district de recensement" (DRs), or census blocks; the farming communities consisted of 25 villages and 72 DRs. For the purpose of census taking, communities were subdivided into DRs (various sized spatial units consisting of the number of households that can be handled by a census interview team on census day). Communities in each stratum were geographically sorted by their DRs. The 1988 census reported on the population size by DR, making it possible to create a cumulative population size list for the communities in each stratum. Subsequently, using the systematic selection method, a total of 20 DRs (ten in each stratum) were sampled.

After the 20 DRs were sampled, a quick screening operation took place in each DR to determine its current (1996) population. The population of the DRs appeared to have changed dramatically from 1988 to 1996. Therefore, raising factors or weights were computed with the help of the 1996 population count of the sampled DRs. Application of such weights in analyses ensure that overall selection probabilities of households at the time of the survey are the same, irrespective of the size of their DR. The 20 (10+10) sampled DRs were located in five fishing villages and five farming villages. Then, in each DR, a fixed number of 25 households was sampled, bringing total sample size to 20×25=500 households. Eventually, 449 households were successfully located and interviewed (231 in fishing villages and 218 in farming villages), yielding an overall enumeration response rate of about 90 percent. Survey results are representative for the fishing communities in the three coastal regions of Louga, Thiès and Saint-Louis.

It follows from the above that analyses of survey data across countries are affected by the following methodological differences:

- Countries vary regarding the spatial level for which survey results are representative: (1) the individual community level (Bangladesh, Malaysia); (2) the municipality level, i.e. a group of fishing villages (The Philippines); (3) the sub-district level, i.e. a small number of fishing communities (Tanzania); (4) the district or regional level, a larger number of fishing villages (India, Senegal).
- Countries vary with regard to the reference population from which households were selected. For instance, in Bangladesh, Malaysia and the Philippines, households in fishing and farming communities were not sampled from a list containing all the households in the community, but from a list of the households of a particular sub-population only. For instance, in fishing communities, the sampling of households was done from a listing of fisherfolk households only. Conversely, in agricultural communities the sampling took place from a community list containing only farming households.

- Countries vary with regard to *eligibility criteria* to determine who in the household receives an in-depth interview and, consequently, for which population category the survey results claim to be representative. This is of particular significance when interpreting and comparing survey

results in the domain of reproductive behaviour. For instance, in Bangladesh, only married women in the 15-49 age group were interviewed, whereas in the Philippines, all women in that age group were interviewed. Conversely, in Malaysia, only the male head of household, his spouse and the oldest son and/or daughter were eligible for interviewing.

3. TRENDS IN THE NUMBER OF COASTAL FISHERS VIS-À-VIS THE STATUS OF FISHERIES RESOURCES AND THE COASTAL ENVIRONMENT

By U. Tietze

This chapter examines the changes which have taken place in the number of fishers over the past couple of decades in the context of general demographic and social trends. It also relates these changes to the level of exploitation of coastal fisheries resources and to the state of the coastal environment.

Global and regional trends in the number of fishers

During the two decades from 1970 to 1990, the number of fishers and aquaculturists more than doubled, growing faster than the world's population, and the number of part-time fishers grew even faster. Although there are other aspects of the importance of fisheries to national economies than employment (e.g. value added, exports, nutrition), "it is noteworthy that, in 1990, fishers represented more than five percent of the economically active population in the agricultural sector of 38 countries, in 15 of which the percentage was above 10 percent" (FAO, 1999a).

According to the latest estimates (FAO, 1999b), the total number of fishers, including those involved in marine and inland capture fisheries and in aquaculture increased from 12.5 million in 1970 to 29 million in 1990 (see Table 1). During the 1990s, FAO suggests that while numbers further increased on a global level, increases were much smaller than in previous decades and the total number of fishers and aquaculturists is estimated to have reached about 30 million in 1997.

The following factors may have contributed to the growth of employment:

- growth of aquaculture owing to an increase in demand for aquaculture products and the availability of suitable aquaculture techniques, production inputs, capital, etc.;
- trade liberalization and deregulation of national economies;
- population growth in coastal fishing communities and migration from other sectors of the rural economy.

Table 1 shows that by far the largest group consisted of so-called "unspecified" fishers, meaning that it is not known whether they were involved in inland fisheries, marine fisheries or in aquaculture. Therefore, no firm conclusions can be drawn regarding the number of marine fishers (consisting chiefly of coastal fishers) and changes in the past, except for the general trends mentioned above.

Table 1 - Number of fishers and aquaculturists in the world, 1970-1990

Category	1970	1980	1990
Marine fishers	3 234 486	4 589 951	5 131 917
Inland fishers	1 590 508	2 300 313	2 763 498
Aquaculturists	416	18 355	3 763 008
Unspecified fishers	7 674 824	10 110 594	17 350 081
Total fishers and aquaculturists	12 500 234	17 019 213	28 981 504

The same is true for trends regarding the number of fishers and aquaculturists in Asia and Africa on a regional level, as shown in Tables 2 and 3 below.

Table 2 – Number of fishers and aquaculturists in Asia, 1970-1990

Category	1970	1980	1990
Marine fishers	1 865 304	2 958 217	2 392 070
Inland fishers	799 831	1 643 840	2 007 902
Aquaculturists	...	6 387	3 700 155
Unspecified fishers	6 858 885	8 948 278	15 887 273
Total fishers and aquaculturists	9 526 020	13 558 722	24 605 832

Note: ... = not reported.

By far the majority of fishers are active in Asia. However, it appears that the number of marine fishers in that region declined between 1980 and 1990. However, the number of "unspecified" fishers considerably increased over the same period. It is not known whether and to what extent marine fishers were included in the category of "unspecified fishers".

Table 3 - Number of fishers and aquaculturists in Africa, 1970-1990

Category	1970	1980	1990
Marine fishers	259 094	304 248	270 870
Inland fishers	686 100	558 384	603 883
Aquaculturists	...	...	...
Unspecified fishers	361 793	646 505	769 697
Total fishers and aquaculturists	1 359678	1 569 637	1 922 434

Note: ... = not reported.

Similarly, in Africa, it cannot be determined to what extent the number of marine fishers and inland fishers had changed, because they were reported under the category "unspecified" in some years and under their original categories in other years.

The tables show that from the figures routinely reported by FAO, little can be said of the trends in the number of marine and coastal fishers, because far too many fishers and aquaculturists were categorized as "unspecified" fishers. Apart from the global and regional levels, this was also found to be the case in five of the six countries covered by the study, namely Bangladesh, India, Malaysia, the Philippines and Tanzania, where the number of marine fishers is not available at all in the FAO statistics, or only for certain years.

In order to obtain a realistic and differentiated picture with regard to demographic trends among marine fishers in the countries covered by the study, namely the Philippines, Malaysia, Bangladesh, India, Tanzania and Senegal, macro-level analysis, desk studies and expert interviews were carried out by the Project. The findings of these macro-level studies are summarized in the following sections.

The Philippines [5]

General demographic trends

The latest census data for the Philippines shows 68.6 million inhabitants in 1995 (National Statistics Office of the Philippines, 1996), making the Philippines the thirteenth most populated country in the world. The annual growth rate of the population slightly decreased from 2.35 percent in 1990 to 2.32 percent in 1995. The latter rate translates into an increase in population of 1.9 million per year.

[5] This section is largely based on Baylon (1997).

Table 4 shows a comparison of the socioeconomic and demographic indicators in the Philippines for the census years 1970, 1980 and 1990 (National Statistics Office of the Philippines, 1974, 1983, 1992).

The indicators in the table show a decreasing population growth rate, consistent with the declining total fertility rate, lower average household size and rising age at marriage. Moreover, an accelerating increase in urban population took place, mainly as a result of people migrating from rural areas to seek employment in the cities.

Table 4 – Socioeconomic and demographic indicators for the Philippines, 1970-1990.

Indicator	1970	1980	1990
Total population	36 684 486	48 098 460	60 703 206
Average annual growth rate %	3.08	2.75	2.35
Sex ratio	99.0	100.7	101.1
Average household size	6.0	5.6	5.3
Proportion urban %	31.8	37.3	48.6
Median age in years	16	18	19
Dependency ratio %	94.5	83.3	75.5
Literacy rate %	83.4	82.7	93.5
Total fertility rate	5.97	5.08	4.09
Average age at marriage of females	18.1	...	20.8
Average number of children born to women aged 15-49 years	4.0	3.5	3.3
Infant mortality rate p.1000	56.0	47.0	33.6
Average family income (P)	6 836	31 052	65 186
Average family expenditure (P)	4 479	26 865	51 991
Average family saving (P)	2 357	4 187	13 195

Note: ... = not reported.

Fisheries

In 1994, the Philippines was ranked the twelfth largest fish producer in the world and the second biggest producer of tuna and tuna-like fishes in Southeast Asia (Bureau of Fisheries and Aquatic Resources. 1995). The fishing industry accounted for 3.9 percent and 4.3 percent of the country's gross domestic product at current and constant prices, respectively. The fishing industry provided a livelihood for about one million people in the Philippines, or five percent of the country's labour force. The total fish production in the Philippines for 1994 was 2.69 million tonnes and valued at P81.30 billion, registering increases of 1.47 percent and 14.3 percent, respectively, compared to the previous year.

The largest share of fish production, in terms of quantity, came from small-scale municipal fisheries (38 percent), followed by medium and large-scale commercial fisheries (33 percent) and by aquaculture (29 percent). In terms of value, the highest share came from aquaculture (43 percent), followed by municipal fisheries (31 percent) and medium and large-scale commercial fisheries (26 percent). Aquaculture consists mainly of fishponds and sea-farming activities in the coastal areas.

Commercial fisheries is defined as involving the use of boats greater than three gross tonnes, while municipal fisheries uses boats of three gross tonnes or less.

Trends and changes in municipal fisheries

In the Philippines, coastal small-scale fishers are referred to as municipal fishers. Municipal fishers are fishers who catch fish without a boat or using a boat of three gross tonnes or less and who fish in inshore areas. Table 5 shows trends in municipal fisheries over the last three decades.

Table 5 – Number of municipal fisherfolk in the Philippines, 1970-1995

Major island group	Number of municipal fisherfolk			
	1970	1980	1990	1995
Luzon	158 714	350 282	377 502	...
Visayas	138 442	296 056	291 384	...
Mindanao	102 786	257 666	294 453	...
Total	399 942	904 004	963 339	675 677

Note: ... = not reported.

The table shows that from 1970 to 1980 the population of municipal fisherfolk increased by 126 percent. The increase between 1980 and 1990 was much smaller, only 6.6 percent. Since then the number of coastal small-scale fishers in the Philippines declined drastically, by 29.9 percent.

The large increase – much larger than the population growth rate – over the period 1970-1980 suggests that fishing provided a superior source of income in coastal areas and attracted considerable labour from other sectors of the rural economy. The considerable decline in the number of coastal fishers in the early nineties show that this was no longer the case. A large number of people once again moved out of fisheries.

In 1995, however, commercial, medium and large-scale marine capture fisheries expanded, employing 56 715 fishers. Aquaculture also expanded considerably, mostly in coastal areas. It more than doubled from 1990 to 1995, employing 258 480 people then. In 1995, therefore, the total number of commercial and municipal marine fishers and (mainly coastal) fish farmers was 990 872, slightly higher than the number of municipal fishers in 1990. It seems that in the nineties, many municipal fishers moved to fish culture and commercial marine capture fisheries.

Table 6 – Fish production in the Philippines, 1970-1993 (tonnes) [6]

Year	Municipal	Commercial	Aquaculture	Total
1970	298 392	...	...	...
1980	753 011	...	...	...
1984	1 089 046	513 335	477 887	2 080 268
1985	1 046 382	511 987	494 742	2 062 111
1986	1 072 361	546 230	470 893	2 089 484
1987	1 060 878	591 192	560 970	2 213 040
1988	1 070 195	599 995	599 544	2 269 744
1989	1 104 626	637 138	629 345	2 371 109
1990	1 131 866	700 564	671 116	2 503 546
1991	1 146 765	759 815	692 401	2 598 981
1992	1 084 360	804 866	736 381	2 625 607
1993	1 030 274	845 431	772 082	2 647 787

Note: ... = not reported.

[6] See Bureau of Fisheries and Aquatic Resources, 1994.

Table 6 shows the municipal fisheries production, which follows a similar trend as the data of Table 5. From 1970 to 1980, the production of municipal fisheries increased by 152 percent. From 1980 to 1990, the increase was 50 percent. From 1991 onwards, the municipal fisheries production started to decline, around the same time as the number of municipal fishers.

Fisheries resources and coastal environment

While commercial marine fisheries and aquaculture production steadily increased, the figures indicate a gradual leveling off of total marine fisheries production. This tendency could be attributed to the overexploitation of fishery resources and to the destruction of fish habitats, e.g. coral reefs and mangroves. About 70 percent of the coral reefs were known to have suffered major damage, while only 30 percent of the original 450 000 hectares of mangroves still remain.

Malaysia [7]

General demographic trends

In 1991, the total population in Malaysia was 18.4 million (see Table 7). The annual growth rate fluctuated around 2.5 percent between 1947-1957, 2.3 percent between 1970-1980 and 2.6 percent between 1980-1991 (Malaysia Department of Statistics, 1995).

The population is expected to reach 32 million in the year 2020 with an average growth rate of 1.7 percent (Masitah, 1995). In 1994, Malaysia's estimated mid-year population stood at 19.6 million (Malaysia Department of Statistics, 1996).

Based on the 1991 census, the population of Peninsular Malaysia categorized as fishing households was estimated at 63 600, which is roughly 0.45 percent of the total population of 14.1 million.

Population distribution

Approximately 50.7 percent of the Malaysian population resided in urban areas in 1991. This proportion is higher than the one shown in previous censuses, but this is partly because of the new, wider definition of urban areas (Malaysia Department of Statistics, 1983).

Fertility and mortality

As shown in the table below, the total fertility rate in Malaysia is following a downward trend, decreasing by one third from 5.0 live births per woman in 1970 to 3.3 in 1991. Mortality declined steadily, as shown by more increases of more than 10 percent in life expectancies and the decline of infant mortality . The trend of lower fertility and reduction in birth and death rates results in fewer children being born and longer life expectancies. In the long run this will increase old age dependency.

The figures indicate that Malaysia is undergoing a demographic transition. Both fertility and mortality rates are declining. The changes in fertility and mortality rates cause changes in the population age structure and family size.

[7] This section is largely based on Kusairi, Tai & Tengku (1997).

Table 7 – Selected demographic indicators for Malaysia, 1970-1991

INDICATORS	1970	1980	1991
Total population (million)	10.3	13.1	18.4
Urban population (%)	26.4	34.2	50.7
Female life expectancy at birth (years)	66.5	70.5	73.7
Male life expectancy at birth (years)	62.2	66.4	69.0
Age structure (%)			
0-14 yrs	44.9	39.6	36.5
15-64 yrs	52.0	56.8	59.8
65+ yrs	3.1	3.6	3.7
Ethnic Composition (%)			
Malay	52.7	55.3	58.3
Chinese	35.8	33.8	28.7
Indians	10.7	10.2	9.4
Others	0.8	0.7	2.9
Other indigenous groups	-	-	0.9
Median age	17.4	19.6	21.9
Rural	16.7	18.7	20.2
Urban	18.9	21.3	23.5
Crude death rate	12.4	7.0	4.6
Infant mortality rate (p. 1000)	39.4	23.9	12.5
Crude birth rate	33.7	30.9	28.1
Total fertility rate	5.0	3.9	3.3
Maternal mortality (p. 1000 women 15-49)	1.40	0.60	0.19
Total dependency ratio (per 100)	92.4	76.0	68.2
Rural	98.0	84.0	79.0
Urban	77.0	63.0	58.0
Juvenile dependency ratio (per 100)	86.5	69.6	62.0
Rural	92.0	77.0	71.0
Urban	71.0	57.0	53.0
Old dependency ratio (per 100)	6.0	6.0	6.0
Rural	6.0	7.0	7.0
Urban	6.0	6.0	5.0
Mean age at first marriage	...	25.0	26.4
Urban	...	26.1	26.9
Rural	...	24.2	25.8
Average household size	5.5	5.2	4.8
Rural	5.4	5.2	4.8
Urban	5.7	5.1	4.8

Note: ... = not reported.

Age structure

The age structure of Malaysia's population is still young. 37 percent of the population was below age 15 in 1991 with a juvenile dependency ratio of 62 percent. The total dependency ratio continued to decline from 92.4 percent in 1970 to 68.2 percent in 1991.

Household size

Families are having fewer children with a greater chance of survival. This trend is reflected in the reduction of the average household size from 5.5 people in 1970 to 4.8 in 1991. The reduction in household size was found in both rural and urban Malaysia.

Average age at first marriage

The mean age at first marriage is on the increase, both in urban areas and in rural areas. It is somewhat lower in the latter. (Unfortunately, this indicator was not available separately for males and females.)

Median age

Fifty percent of the Malaysian population in 1970 was under 17.4 years of age. The median age increased to 19.6 years in 1980 and further to 21.9 in 1991 (See Table 7) indicating an older population age structure and an impending aging of population. Further, the median age of the urban population was older than the rural population, signifying the graying of the urban population.

Educational status

The educational status of the population can be assessed through school enrolment as well as through literacy ratios. The percent of the population aged six and above who have attended school increased from 77 percent in 1980 to 84 percent in 1991. The increase in school attendance was greater for females than for males. However, school attendance was still lower in rural areas than in urban areas (Malaysia Department of Statistics, 1995).

The literacy rate of the population above the age of ten in Malaysia in 1991 was 86 percent. The urban population was more literate (91 percent) than the rural population (81 percent).

Household income

The mean gross monthly income for households increased from RM 1 167 in 1990 to RM 2 007 in 1995. The percentage of households earning between RM 1000 and RM 3 000 per month increased during the same period from 33 percent to 47 percent, while the percentage of households earning less than RM 1 000 per month declined from 61 percent to 36 percent.

In line with the general improvement in household income, rural households also reported higher incomes. In 1990, the rural household monthly income was RM 951. It increased by 37 percent in 1995, to RM 1 300. Urban households recorded a higher increase (60 percent), from RM 1 617 in 1990 to RM 2 596 in 1995.

Health status

The health status of the population improved considerably as reflected in the demographic statistics. The improvement can be attributed to extensive health delivery systems, namely the Maternal and Child Health services (MCH) targeted for the rural population and disadvantaged groups in the urban areas. Owing to these services, maternal mortality and infant mortality have been reduced to rather low levels..

Population policies

The new population policy of the government aims at slowing down the decline of the population growth rate. The overall aim is still the reduction of the total fertility rate to the replacement level of 2.05, but this would be achieved by the year 2070 only. A stable population of around 70 million by the year 2100 is the long-term objective.

Fisheries

The marine fisheries sector in Malaysia has undergone rapid change during the past three decades. The remarkable development of the sector during the mid-sixties and seventies has resulted in a considerable increase in the number of fishing units, fisherfolk, motorized vessels and the expansion of total fish landings. One significant factor that provided considerable impetus to the fishery development during this period was the Government policy to eradicate poverty by improving productivity.

Rapid development and adoption of modern fishing technology in the sixties and seventies resulted in the dualistic character of the fishery sector in Peninsular Malaysia. The traditional fishery sector is typically small-scale, using vessels of less than 40 Gross Registered Tons (GRT) using traditional fishing gears. The inshore vessels operate within territorial waters twelve nautical miles from shore. The commercial sector uses larger vessels (greater than 40 GRT) that typically operate further offshore, using commercial gears such as trawls and purse seines.

The improvements in fishing technology and productivity in the sixties and seventies had severely negative impacts on the fish stocks in Peninsular Malaysia. By the eighties and early nineties much of the fish stocks, particularly in inshore areas on the West coast of Peninsular Malaysia, were overexploited. As a result, since the eighties fishery policies were oriented towards resource conservation and management of the fishery resources on a sustainable basis. During this period, inshore fishing fleets and the number of inshore fishers were reduced and consolidated in order to achieve the optimal level consistent with the sustainable resource objective. This has contributed towards the increased productivity of the hitherto low productivity traditional fisheries sector.

The proclamation of the 200 nautical mile Exclusive Economic Zone (EEZ) in the early eighties extended the fishery jurisdiction and expanded the resource base for Malaysia. The development of offshore fishing was given greater emphasis. By issuing licenses, private entrepreneurs and inshore fishers were encouraged to invest in offshore fishing. The development of offshore fishing has increased the production capacity and productivity of marine fishery in Peninsular Malaysia, particularly on the East coast.

Trend in the number of fishers

Statistics on the number of fishers in Malaysia refer to fishers who were working on mostly small and medium-scale licensed fishing vessels. As can be seen from Table 8 (based on FAO, 1999a, and Malaysian fisheries statistics), the number has been steadily increasing from 1970 to 1980. This increase was part of the rapid expansion of the fishing industry. Since then, the trend has been reversed. The number of fishers steadily declined to its lowest level in 1993. This was probably because of the overexploited state of the fishery resources and government measures reducing the number of licensed fishing vessels in order to conserve and rehabilitate marine resources.

Besides the deliberate Government policy of reducing the number of fishers, especially in the inshore coastal areas, the gradual decline in the number of fishers is also related to improved

employment opportunities in other sectors. The awareness of fisherfolk themselves of these changes and processes, along with developments at the micro-level will be detailed further below.

Table 8 - Number of fishers working on licensed fishing vessels in Malaysia, 1970-1995

Year	Number of fishers
1970	81 729
1973	85 187
1976	92 924
1980	119 642
1983	107 353
1987	96 389
1990	88 494
1993	80 278
1995	82 200

Marine fish landings

The trend in marine fish landings in Peninsular Malaysia (Table 9) can be divided into three stages. Between 1969 and 1981, landings increased by about 115 percent from about 303 to 649 thousand tonnes. However, the trend was reversed between 1981 and 1986, when they decreased to about 446 thousand tonnes. In the third stage, from 1987 to 1993, landings again increased from 741 to 792 thousand tonnes, because of the development of offshore fishing. Generally, the West Coast has contributed to a larger proportion of the Peninsular Malaysia's marine landings compared to the East Coast, but the gap between these two coasts has been narrowing in recent years (see Table 9).

Table 9 - Marine fish landings in Peninsular Malaysia, 1969-1992 (tonnes)

Year	West Coast	East Coast	Peninsular Malaysia
1969	247 518	55 088	302 606
1970	234 228	64 777	299 005
1971	253 134	69 928	323 061
1972	230 487	80 622	311 109
1973	280 654	90 576	371 230
1974	317 814	121 761	439 576
1975	270 664	104 570	375 234
1976	294 579	116 389	410 968
1977	377 866	120 086	497 951
1978	410 774	153 757	564 531
1979	432 347	138 558	570 905
1980	493 446	129 484	622 930
1981	433 369	215 944	649 313
1982	434 190	133 337	567 527
1983	441 573	166 913	608 486
1984	347 744	133 897	481 640
1985	327 124	135 737	462 861
1986	324 047	122 329	446 376
1987	499 862	240 703	740 565
1988	430 188	264 261	694 449
1989	489 334	257 550	746 884
1990	510 471	309 432	819 903
1991	401 900	307 687	709 587
1992	473 995	293 537	767 532

State of coastal environment - Mangrove areas

Mangrove areas generally enhance the availability of food in areas near the shore. Because of this and their ability to provide shelter or protection from predators, mangrove areas function as significant nurseries or spawning grounds for many fish species. The extent of mangrove areas is one indicator of the state of the coastal environment that will influence fish productivity.

Table 10 shows the transformation in the area of mangrove reserves in Malaysia between 1980 and 1990. Except for Malacca, all states showed decreases in mangrove areas. In Peninsular Malaysia, the reduction was more pronounced on the East Coast than on the West Coast. The percentage of destruction of mangrove areas in Sarawak was above the national average, while the percentage in Sabah was lower. Figures for the period 1955-1980 showed that the main reason for the conversion of mangrove forests to non-forestry use was agriculture (85 percent). Aquaculture accounted for only four percent of the conversions.

Table 10 - Mangrove areas in Malaysia, 1980-1990 (ha)

State	1980	1990	% change
Kedah	9037	8034	- 11
Penang	406	406	–
Perak	40869	40869	–
Selangor	28243	21983	- 22
N. Sembilan	1352	1061	- 22
Malacca	77	314	+ 408
Johor	25619	16697	- 35
Total West Coast	105603	89364	- 15
Pehang	2496	2031	- 19
Terengganu	2982	954	- 68
Total East Coast	5478	2986	- 45
Sarawak	44491	36992	- 17
Sabah	349772	316460	- 10
Total Malaysia	505344	445802	- 12

The level of the exploitation of fisheries resources may be inferred from data on (a) the ratio of so-called trash fish to total landings and (b) the catch per unit of fishing effort (table 11).

Table 11 - Indicators of exploitation of fisheries resources in Peninsular Malaysia, 1970-1991

	1970		1980		1991	
Trash fish landings	Tonnes	% of total	Tonnes	% of total	Tonnes	% of total
West Coast	43,989	18.8	124,103	25.1	141,794	35.3
East Coast	12,536	19.3	19,009	14.6	105,892	34.4
Penins. Malaysia	56,524	18.8	143,112	22.9	247,686	34.9
Catch per vessel (t.)						
West Coast	12.97		12.45		14.88	
East Coast	9.47		20.23		42.72	
Penins. Malaysia	11.88		14.15		20.82	

The term "trash fish" denotes juvenile and undersized fish of commercially valuable and target species, as well as fish belonging to commercially non-valuable and non-target species that are generally not used for human consumption but converted to fishmeal used e.g. as feed or fertilizer. An increasing share of trash fish in overall landings is an indication of gross overfishing. The landings of trash fish as a part of total landings increased considerably from 1970 to 1991 in Peninsular Malaysia. The increase was very pronounced between 1980 and 1991.

Catch per vessel here refers to commercially valued species only, excluding shellfish and trash fish. That indicator of productivity decreased from 1970 to 1980 for the West Coast, indicating that fisheries resources in this region were being overexploited. The subsequent increase in the eighties reflects the government policy of controlling fishing effort. For the East Coast, the catch per vessel increased from 1970 to 1991. This contributed to an increase for Peninsular Malaysia as a whole over the period. The increase that occurred on the East Coast may be attributed to the government fishing effort control policy as well as to an increase in fisheries resources in the region because of the proclamation of the 200-mile EEZ and the subsequent expansion of the deep-sea fishing fleet. However, there are signs that the increase is subsiding.

Bangladesh [8]

General demographic trends

Bangladesh is the ninth most populous country of the world, with an estimated population of 129 million in 2000 (United Nations, 1999). In 1995, its population density was 819 persons per square kilometer – the highest in the world for a country of such a size (Bangladesh Bureau of Statistics, 1996). Rapid population growth has been one of the greatest hindrances to development in Bangladesh. It has resulted in an enormous pressure on all types of resources including land, employment and a high dependency ratio. It has also exacerbated the problems of environmental degradation and overextended social services.

In recent years, however, Bangladesh has achieved some success in reducing the population growth rate, as a result of highly concerted family planning efforts launched by government and non-governmental organizations. Nevertheless, the population growth rate is still high and its reduction is a major aim of the Government. The short-term goal is to achieve a net reproduction rate of one by the year 2005. Thus, the population growth rate would decline from around 1.85 percent in 1995 to 1.23 percent in 2005 (Bangladesh Bureau of Statistics, 1996).

The percentage of the rural population decreased from 84 percent in 1981 to 78 percent in 1995 (Bangladesh Bureau of Statistics, 1996). Trends in the size and growth rate of the total population, rural population and marine fishers during 1980-1994) are summarized in Table 12. The number of marine fishers increased by some 37 percent during the period, implying with an average annual growth rate of 2.5 percent. This is faster than the rates at which both the rural and total population increased – respectively 1.6 percent and 2.1 percent.

The main reasons for the rapidly increasing number of marine fishers are: (a) the lack of occupational diversification and mobility in coastal fishing communities; (b) migration from different islands to coastal areas because of land erosion and for better settlement; (c) the fact that the rural poor turned to fishing from other occupations. However, though the number of fishers increased over time, a decreasing trend in their rate of growth can be observed.

[8] This section is largely based on Rezaul (1997).

Table 12 - Size and growth rate of total and rural population and marine fishers in Bangladesh, 1980-1994 [9]

Year	Population (000)		Marine fishers (000)	Growth rate (%)		
	National	Rural		National	Rural	Marine fishers
1980-81	89 912	75 823	412			
1985-86	100 985	84 373	475	2.35	2.16	2.89
1990-91	111 455	89 000	531	2.17	1.62	2.25
1993-94	117 700	93 383	566	1.83	1.62	2.15

Fertility and mortality

Changes in key fertility indicators for total and rural Bangladesh are shown in Table 13.

Table 13 - Fertility indicators: Bangladesh, national and rural population, 1981-1995 [10]

Indicators	1981		1991		1995	
	National	Rural	National	Rural	National	Rural
Total fertility rate	5.04	5.28	4.24	4.48	3.50	3.70
Gross reproduction rate	2.45	2.56	2.06	2.17	1.81	1.98
Net reproduction rate	1.89	1.96	1.64	1.71	1.43	1.62

The table indicates a decreasing trend in fertility rates of both the general and rural population. The national crude birth rate decreased from 34.6 per thousand in 1981 to 26.9 in 1995. In rural areas, a higher crude birth rate was found than in urban areas. The total fertility rate in Bangladesh declined from 5.04 in 1981 to 3.50 in 1995. Declining trends were also found in the gross reproduction rate and in the net reproduction rate both rurally and nationally.

Fertility rate indicators in rural Bangladesh were higher than the national average. High rural fertility is related to lack of education, lack of female employment, lack of awareness of family planning, high infant mortality, non-availability of clinical aids to family planning, early marriage and other factors.

Table 14 - Mortality indicators: Bangladesh, national and rural population, 1981-1995 [11]

Indicators	1981		1991		1995	
	National	Rural	National	Rural	National	Rural
Infant mortality rate	111.5	112.5	92.0	94.0	77.7	83.3
Child mortality rate	16.5	17.5	13.6	14.4	9.7	10.2
Maternal mortality rate	6.5	6.7	4.7	4.8	4.5	4.9

Table 14 shows that mortality, both in terms of the national average and in rural areas of Bangladesh, has declined over the years, but is still high. The decline in infant mortality – a crucial component of overall mortality – has been slower in the rural areas than at national level. The same trend is apparent regarding maternal mortality (which, although a very small component of overall mortality, is extremely indicative of women's condition). The fact is that health facilities are not as developed in rural areas as in urban areas. More generally, lack of education, sanitation, communication, poverty, etc. are cited as causes of higher mortality in rural areas of Bangladesh.

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[9] Table based on information contained in: Bangladesh Bureau of Statistics (1996b: 28, 168); Rezaul & Hossain (1996a); and Liaquat (1996).

[10] See Bangladesh Bureau of Statistics (1987: 51; 1994: 37; 1996: 2).

[11] *Ibid.*

Overall, the life expectancy at birth for both sexes combined increased from 46 years in 1974 to 58 years in 1995 (Bangladesh Bureau of Statistics, 1996: 3; 1982: 327). This is a moderate increase, which leaves life expectancy at a relatively low level.

Chapter 5 will examine fertility and mortality patterns and other demographic characteristics in fishing communities, based on the household survey conducted by the Project.

Household size

The average household size in marine fishing communities in Bangladesh was remarkably higher than the national average, as shown in Table 15. One reason for the larger household sizes in fishing communities seems to be the demand for labour in marine fishing, where work groups are still largely based on kin groups. This seems to create social conditions more conducive to the formation of large residence units than in other population segments. A downward trend in household size can be observed in all categories, however, and that decline was faster among fishers.

Table 15 - Average size of households in Bangladesh, 1981-1995 [12]

	National	Rural	Fisherfolk
1981	5.7	5.7	7.3
1991	5.5	5.5	6.5 a
1995	5.4	5.4	6.4 b

a = 1989/90
b = 1994

Fisheries

The fisheries sector accounts for about three percent of the Gross Domestic Product (GDP) of Bangladesh, nine percent of its export earnings and nearly ten percent of total employment. About three quarters of the nation's animal protein consumption comes from fish (Nuruzzaman, 1994: 76). In 1993/94, the number of marine fishers was about 566 000 out of a total of 1.3 million fishers in the country. The fishing fleet consisted of about 60 000 traditional fishing boats, nearly 4 000 motorized boats and more than 50 trawlers (*ibid.*:14).

The fisheries sector can be broadly divided into four sub-sectors: (a) inland capture fisheries (rivers, estuaries and flood plane fisheries); (b) aquaculture (primarily pond fishery and coastal aquaculture); (c) marine industrial (large-scale) capture fisheries; and (d) marine artisanal (small-scale) fisheries.

Small-scale fisheries play a very significant role in Bangladesh fisheries. Prior to the introduction of mechanized boats, the entire marine fish catch of the country came from this sector. Even now, it generates more than 80 percent of all marine fish landings and all inland fish production.

Trends in the number of fishers, fisheries resources and the coastal environment

Table 16 shows changes in the number of fishers and in fishing areas available per fishers.

[12]Table compiled from information contained in: Bangladesh Bureau of Statistics (1996b) and in Huq (1986).

Table 16 - Marine fishers and fishing areas in Bangladesh, 1984-1994 [13]

Year	No. of fishers (000)	Percentage of marine fishers to total	Marine fishing area per fisherman (sq. km)
1984/85	450	38	0.28
1985/86	475	39	0.26
1986/87	486	39	0.26
1987/88	497	40	0.25
1988/89	508	41	0.25
1989/90	520	40	0.24
1990/91	531	40	0.24
1991/92	543	40	0.23
1992/93	554	40	0.23
1993/94	566	41	0.22

The total number of marine fishers increased by 26 percent during the period 1984-1994. This increase was faster than that in the total number of fishers (including inland fishers). As the marine fishing area is constant, the result was that fishing area per fisherman decreased by about 22 percent during the period.

The total fish production in Bangladesh in 1993/94 was about 1.1 million tonnes, out of which 76 percent was from inland fisheries, and the rest from marine fisheries. Regarding inland fisheries, 68 percent of the catch came from the open water capture fisheries, and the rest from closed water culture fisheries, i.e. from ponds, "baors" (closed-off river branches) and coastal aquaculture. Table 17 shows the annual increase in catch from different sources of fisheries.

Table 17 - Fish production: relative share and growth rate for different types of fisheries in Bangladesh, 1984-1994 [14]

Type of fishery	Fish production (tonnes)		Relative share % in 1993-94 catch	Annual growth rate
	1984/85	1993/94		
Inland capture	462 605	573 376	52.6	2.3
Inland culture	123 811	267 748	24.2	8.6
Marine industrial	12 440	12 454	1.1	0.0
Marine artisanal	175 123	240 590	22.1	3.5
Total	773 979	1 094 168	100	3.8

Table 17 shows that during the period 1984-1994 total fish production increased by 41 percent. The increase in the production of inland culture fisheries was much more rapid than in other sectors.

As shown in Table 18, however, per capita supply increased by only 17 percent because of a 20 percent increase in population.

[13] Table based on information contained in Bangladesh Bureau of Statistics (1996b: 168) and in Rezaul & Hossain (1996a: 4, 7).

[14] Table based on information contained in Department of Fisheries of Bangladesh fish catch annual reports and in Rezaul & Hossain (1996b).

Table 18 - Per capita fish catch: Bangladesh, 1984-1994 [15]

Year	Total catch (tonnes)	Size of population	Per capita catch (kg)
1984/85	773 979	98 666 346	7.84
1985/86	793 923	100 985 005	7.86
1986/87	814 675	103 358 153	7.88
1987/88	827 105	105 787 069	7.82
1988/89	840 926	108 273 066	7.77
1989/90	855 527	110 817 482	7.72
1990/91	895 935	111 455 185	8.04
1991/92	952 079	113 873 763	8.36
1992/93	1 020 654	116 344 823	8.77
1993/94	1 094 168	118 869 506	9.20

Table 19 deals with marine fish catch per fisher, i.e. productivity of labour in the sector. It indicates that, while total marine fish catch increased by 35 percent during the decade, the catch per fisherman increased by only eight percent as the number of fishers increased by 25 percent.

Table 19 - Catch per fisher in Bangladesh, 1984-1994 [16]

Year	Marine fish catch (tonnes)	Marine fishers (000)	Catch per fisher (kg)
1984/85	187 563	450	416
1985/86	207 401	475	436
1986/87	217 579	486	447
1987/88	227 582	497	457
1988/89	233 281	508	459
1989/90	239 063	520	459
1990/91	241 538	531	454
1991/92	245 474	543	452
1992/93	250 492	554	452
1993/94	253 044	566	447

It may be concluded that despite various difficulties, the total catch per fisherman and per capita for the nation as a whole has slowly increased. However, considering that fish alone meets nearly three quarters of the nation's total animal protein consumption, a per capita fish catch of 9.2 kg corresponds to a very low per capita consumption of animal protein.

The other significant trend shown in the above table relates to the fact that for the last eight years, the catch per fisher has been stationary at about 450 kg. There seems to be a strong possibility that in future that productivity keep stagnating or even start declining under the effect of increasing numbers of fishers and limited resources.

There are strong indications of a decline in stocks of different fish and prawn species in Bangladesh. This can possibly be attributed to the combined or synergistic effects of environmental change, degradation of water quality because of pollution, fish epidemics caused by ulcerative disease and heavy fishing. The dramatic expansion of coastal shrimp culture yielding significant foreign exchange earnings (about 11 billion Taka in 1995/96) has now raised a number of problems such as environmental degradation, disease and destruction of fisheries during wild shrimp fry collection.

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[15] Ibid.

[16] See Rezaul & Hossain (1996b).

India [17]

General demographic trends

India is the second most populous country in the world, with its estimated 1995 population of 934 million, projected at 1 013 million in 2000 (United Nations; 1999). Its growth rate is currently estimated at about 1.6 percent, meaning a net increase of about 16 million persons annually.[18]

The total fertility rate has been halved since 1950, from about six live births per woman to three.[19] Because survival was undergoing rapid improvements, however, at first the net reproduction rate (i.e. the average number of surviving daughters replacing a woman at childbearing age) increased till about 1970. It has now been reduced to about 1.3 – which still implies a substantial expansion in numbers from one generation to the next.

Indeed, mortality has been much reduced during the second half of the century. The infant mortality rate, for instance, declined by 62 percent (from 190 to 72 per 1000). Life expectancies rose by 58 percent for males (to 62.3 years) and by 66 percent for females (to 63 years), reversing a heretofore marked pattern of excess female mortality. Nevertheless, the sex distribution is still characterized by a greater number of males than of females (the sex ratio is about 107), due to the said past mortality differential.

An original feature of India is its rather slow pace of urbanization as compared with other developing countries: for instance, the percentage urban increases more slowly than in Asia as a whole (+1.2 percent vs. +1.6 percent) and the percentage rural decreases more slowly (-0.5 percent vs. -0.9 percent). As a result, India remains a predominantly rural country: 27 percent only of its population lives in urban areas, compared to 37 percent for Asia as a whole.

Fisheries

Fisheries is an important sector in the economy of India: 5.9 million people were directly or indirectly involved in fishing, fish processing, marketing or other related activities in 1997/98. In the late 1980s, fisheries accounted for 1.3 percent of the GDP of India and for 4.1 percent of the GDP generated in the agricultural sector (Government of India, 1990: 3, 10). With a total fish production of 5 388 million tonnes in 1997/98, India occupied the seventh position in the world.

India has a coastline of 8 041 kilometers, with an EEZ of 2 million sq.km. Marine fisheries potential within the Indian EEZ is 3 921 million tonnes, out of which the pelagic resource potential is 1 742 million tonnes, excluding oceanic pelagic fishes, which are not currently exploited (India Ministry of Agriculture, 1996).

The Indian fishing fleet comprising traditional as well as mechanized boats and offshore shrimp trawlers operate mainly within inshore areas, particularly for demersal species, although some vessels go beyond these areas when fishing for other species. Barring a few tuna vessels, there were practically no other deep sea fishing vessels engaged in fishing in the EEZ, which extends up to 200 nautical miles from the coast.

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[17] This section is largely based on Tewari, Acharya & Singh (1997).

[18] As India's population growth rates is expected to remain higher than that Of China in the coming decades, India is projected to become the most populous country before 2050, at around 1.5 billion inhabitants.

[19] Indications on current characteristics refer to the 1995-2000 period (United Nations, 1999).

In 1995, about 238 000 small fishing craft exploited the fisheries to land their catches in about 2 300 marine landing centres along the coast. Besides these, there were about 150 fishing boats of 22-28 metres in total length and approximately 400 boats of 15-17 metres in total length. There were also eight tuna longliners operating in this area.

Overall, the number of mechanized fishing boats almost doubled between 1987 and 1995, from about 24 000 to 47 000. The increase in the number of mechanized boats was particularly steep in the first half of the nineties. During the same period the number of traditional fishing craft increased much more slowly.[20]

Table 20 indicates the contribution of different types of fishing vessels to total landings, for four broad regions within India in 1993. Balan *et al.* (1995) report that in the same year, mechanized boats contributed about 60 percent of total landings for the whole country. The table shows that traditional fishing craft accounts for a minor share of the landings in all regions except the northeast.

Table 20 -Percentage contribution to marine landings by type of boat in different regions of India, 1993

Region	Mechanized fishing boats [a]	Traditional non-motorized fishing craft [b]	Traditional motorized fishing craft [c]	Total traditional craft [b+c]
Northeast	24.4	58.6	17.0	75.6
Southeast	51.5	14.0	34.3	48.5
Southwest	66.1	29.0	4.9	33.9
Northwest	56.2	33.6	10.2	43.8

Trends in the number of fishers

Fishing as an occupation in India is traditionally confined to fishing communities in 3 726 villages scattered along the coast. An analysis of census data from 1977 to 1987 reveals that over this period the total fisherfolk population (comprising all household members of full-time and part-time marine and inland fisherfolk households) increased by 36 percent, from 6.1 to 8.3 million. The statistics unfortunately do not distinguish between marine and inland fisherfolk.

According to the same data, the number of economically active fisherfolk including fishers, as well as those involved in fish processing and marketing, increased by 155 percent between 1977 and 1994. This large increase, however, seems mainly due to a change in statistical classification: apparently, since 1992, fisherfolk involved in fish marketing and processing, boat building, net making, etc. are included in the statistics, which they were not before.

Table 21 - Economically active fisherfolk population in India, 1977-1994

Year	Number	% increase
1977	1 340 100	
1982	1 521 700	13.6
1987	1 546 100	1.6
1992	3 251 632	103.1
1994	3 420 647	5.19

[20] (14 percent only during 1977-1994.)

As can be seen from Table 21, the number of economically active fisherfolk was still increasing during the first half of the recently concluded decade. Again, the census figures do not distinguish between marine and inland fisherfolk.

For the State of Maharashtra, where the household survey and focus group discussions were carried out, census reports of the Department of Fisheries do show the figures for the marine fisheries sector separately (Table 22). These figures show that the number of marine fisherfolk households, marine fishers and those involved in fish marketing, processing, net-making and other fisheries related activities has steadily increased over the years. The figures also suggest that the majority of fisherfolk in Maharashtra still follow the traditional occupation of fishing. The vast majority of marine fishers were involved full-time in their traditional occupation.

Table 22 - Marine fisherfolk population trend in Maharashtra and involvement of fisherfolk in various economic activities

Year	No. of households	No. of household members	Economically active population				
			Full-time fishers [a]	Part-time fishers [b]	Marketing, processing, net making, etc. [c]	Total fisheries-related activities [a+b+c]	Non-fisheries activities
1972	33 881	201 423	36 341	...	...	86 876	15 415
1977	38 178	224 040	42 237	...	...	100 379	19 850
1987	43 890	246 981	47 653	2 672	57 052	107 377	15 290
1992	46 738	252 271	50 754	3 815	64 699	119 268	13 739

A considerable number of household members were involved in non-fisheries economic activities. This shows that multiple survival strategies were being followed in view of rising costs of living and declining catches that had forced fisherfolk to look for alternative sources of income. The trend to occupational mobility, however, as shown by the household survey presented further below seems to be mostly limited to areas close to cities. The overall involvement in non-fisheries related activities has even declined over the last two decades.

Tanzania [21]

General demographic trends

Population growth in Tanzania has been quite rapid (around 3 percent annually) since the 1960s: see Table 23, which assembles data from the last three censuses. The population in 1995 was estimated at 29.9 million by the United Nations (1999), with an average growth rate of 2.6 percent since 1990.

Table 23 - Intercensal population growth in Tanzania, 1967-1988

Area	Population			Annual growth rates	
	1967	1978	1988	1967/78	1978/88
Mainland	11 958 654	17 036 499	22 533 758	3.2	2.8
Zanzibar	354 815	474 111	640 685	2.7	3.0
Tanzania	12 313 469	17 512 610	23 174 443	3.2	2.8

[21] This section is largely based on Maghimbi (1997).

Fertility is high: for the period 1990-95, the United Nations (*ibid.*) estimated the total fertility rate at 5.9 live births per woman, corresponding to a gross reproduction rate (female births per woman) of 2.9 and a net reproduction rate (daughters surviving to childbearing age) of 2.2.

As suggested by the difference between gross and net reproduction rates, mortality also is high, however. Life expectancy at birth in 1990-95 was estimated at 50.8 years for females and 48.1 for males (i.e. below the averages for sub-Saharan Africa and the least developed countries) and infant mortality at 87 per 1000 (United Nations, 1999). According to the same source, life expectancies have been declining since 1985-1990.

The high fertility appears to be largely wanted, according to surveys taken during the 1990s. The 1991/92 DHS for instance indicated that, for women between 15 and 49 on Tanzania mainland, the average number of children wanted was 5.6, while the actual total fertility rate was 6.25. The positive attitudes towards having many children go hand in hand with the inadequate use of contraceptives. According to the KAP survey of 1994, only 17 percent of couples used contraceptives, out of whom 11 percent employed modern methods. Another factor contributing to low fertility rates and population growth was early marriage. According to the 1991/1992 DHS, the median age at which women then aged 20-49 had first married was 18.3 years.

Fertility in the coastal regions of Tanzania seems to be lower than in the rest of the country: according to the 1991/92 Demographic and Health Survey (DHS), the total fertility rate of women from ages 15-49 was 5.7 in coastal areas and 6.3 at national level. The Knowledge, Attitudes and Practices (KAP) Survey carried out in 1994 suggested a slight decline in the above indicators, but showed that fertility rates were still high. The total fertility rate was found to be 4.9 in the coastal regions and 5.6 in the country as a whole.[22] Of course, it is to be remembered that the coastal regions include the capital and other urban centers, and that fertility usually is significantly lower in urban areas.

Literacy levels are low in rural Tanzania (including in the coastal regions): 67.2 percent for males and 48.2 for females aged ten and over. Levels of educational achievement are also low.

Trends in the number of fishers

Demographic data on fisherfolk cannot be extracted from national population censuses because for the past two decades fishing is no longer included as a separate economic activity. Similarly, neither the DHS of 1991/1992 and 1996 nor the KAP Survey of 1994 had fishers as a category.

Statistics on the number of fishers, however, are collected and published by the Fisheries Division of the Ministry of Tourism, Natural Resources and Environment in their annual statistics reports. The figures refer to full-time fishers and do not include part-time and occasional fishers. While the statistics do not distinguish between artisanal and industrial fishers, it can be assumed that the vast majority of them were artisanal fishers. Table 24 is based for some years on these statistics and for others on figures reported to FAO. It shows the dramatic increase of the number of fishers from 1980 to 1981. The number peaked in 1991 and started to decline in 1995.

[22] The median number of children ever born to women aged 15-49 was 6 and 6.7 respectively.

Table 24 - Number of fishers in coastal marine fisheries in Tanzania, 1980-1997 [23]

Year	Number of marine fishers
1980	7 596
1981	13 176
1984	13 783
1988	12 739
1991	16 361
1995	13 176
1997	13 783

Migration in and out of fisheries is part of the rapid social, economic and demographic dynamics that the coastal belt of Tanzania has been experiencing. Migration to coastal fisheries during the 1980s should be seen in the general macro-economic and political context of the country. The Tanzanian economy performed badly in the 1970s and 1980s. The policy of creating communal villages disrupted farming activities and led many peasants to abandon their established farms of permanent crops such as cashew nuts and coconuts and turn to fishing. Particularly in times of crisis and instability, fishing for many people seems to be more remunerative, or safer, than farming – fishing generates food almost daily, while the farmer has to wait for months before a crop can be harvested.

During the 1990s, it seems that the trend was reversed: people started to migrate out of fisheries to urban centres that offered a wider range of employment and income, in the wake of declining catches and income probably due to the overexploitation of fisheries resources.

Fisheries resources and the coastal environment

The main indicators of growing pressure on the coastal fisheries resources of Tanzania have been the increasing use of dynamite for fishing; and the destruction of mangrove areas. The use of dynamite and mangrove destruction seem to be related to the increase in the number of fishers and declining productivity of work on traditional fishing grounds. These difficulties were compounded by the growing presence of trawlers in fishing grounds traditionally fished by artisanal fishers, most of those intruders being foreign and not licensed to fish in Tanzanian waters.

Fishery officers and fishers see dynamite fishing as a cause of decline in fish production. Dynamite fishing was increasingly adopted in the 1970s and 1980s when the number of fishers was rising rapidly and the supply of fishing gear was declining, because of the lack of foreign exchange for its importation. The production of local manufacturers was also declining owing to the lack of imported raw materials.

The destruction of mangrove areas close to the fisherfolk settlements is a problem along the entire coast of Tanzania. The wood of mangrove trees is used for boat building, smoking of fish, furniture, house construction, firewood and charcoal making. Mangrove poles were also exported to Middle East countries. There has also been massive clearing of mangrove areas to make way for new settlements (Chachage, 1988). This seriously threatens fisheries resources, because mangrove habitats serve as nursery grounds for a large number of fish species and crustaceans (Siegel, 1986).

[23] Source: FAO (1999) and compilation based on reports by Ministry of Tourism, Natural Resources and Environment, Fisheries Division, of Tanzania.

Senegal [24]

General demographic trends

Like many other developing countries, Senegal experienced substantial population growth since 1960. From 3.2 million at that date, the population increased to about 8.3 million in 1995 (United Nations, 1999; see Table 25), at an average rate of 2.8 percent. Its population in 2000 is estimated at 9.5 million persons, projected to reach more than 15 million in 2020.

Table 25 - Population growth in Senegal, 1960-2000

Year	Population (thousands)	Annual growth rate (%) in the preceding period
1960	3 187	2.5
1970	4 158	2.7
1980	5 538	2.9
1990	7 327	2.8
1995	8 330	2.6

Seventy percent of the population of Senegal lives in the coastal provinces (Dakar, Thiès, Saint-Louis, Ziguinchor, Louga, Fatick and Kaolack), as shown in Table 26.

Table 26 - Distribution of the population in Senegal by province, 1976-1995 (%)

Province	1976	1988	1995
Dakar	18.8	21.6	23.2
Ziguinchor	5.8	5.8	5.7
Diourbel	8.5	9.0	9.3
Saint-Louis	10.3	9.6	9.1
Tambacounda	5.7	5.6	5.5
Kaolack	11.9	11.8	11.6
Thiès	13.5	13.6	13.7
Louga	8.4	7.1	6.4
Fatick	8.2	7.4	6.9
Kolda	8.8	8.6	8.6
Total	100	100	100

Generally, most provinces are gradually losing demographic weight as migration favours the area of Dakar. This reflects, to a large extent, the rising differences in the development of the various regions and concentration of social services, infrastructures and employment opportunities or expectations in the capital. It also reflects the growing difficulties in the agriculture sector in Senegal in structural adjustment processes, and a reduced role of the Government (including in financial assistance to agriculture). In the new centres of development, i.e. mainly the coastal regions of Dakar and Thiès, the fisheries sector played an increasingly important economic role and continued to attract people from other parts of the country, and other sectors of the rural economy who were in search of income and employment.

Fertility is still high. The total fertility rate is estimated at 6.06 for 1990-95 (United Nations, 1999), which is consistent with the figure reported for 1992 in Table 27. A decline is underway, mainly related to an increase in age at marriage. The use of contraception is not an important factor yet as

[24] This section is largely based on Gueye (1997).

prevalence is still at low levels.[25] Table 27 also shows that a significant gap between urban and rural fertility levels is developing as fertility declined earlier and faster in urban areas – whereas in rural areas the average number of births per women was still close to seven in 1992, that number had come down to about five in urban areas. Figures by region confirm this in that the western region (which includes Dakar and other coastal cities) had significantly lower fertility than the others.

Table 27 - Total fertility rate in different regions of Senegal, 1978-1992

Geographic area	1978	1986	1992
Urban	7.54	5.5	5.06
Rural	7.48	7.1	6.74
West	7.07	7.0	5.55
Central	7.23	7.0	6.26
Northeast	7.21	7.2	6.55
South	7.33	6.8	6.47
Total	7.15	7.0	6.03

Mortality is relatively high. Life expectancy at birth in 1990-95 is estimated at 52.6 for females and 48.3 for males, which is a little better than the average for sub-Saharan Africa but markedly worse (by about ten years) than the average for developing regions (United Nations, 1999).

Table 28 presents additional data on infant and child mortality for regions within Senegal and the country as a whole. Whereas declines in these indicators are visible, both are still high.

Regarding geographical differences, the situation is much better in urban areas, where these mortality indices for the early years are about half those of rural areas. Some progress seems to be underway in reducing the gap of infant mortality, however. It is clear that regional differences are substantial too – infant mortality in the Northeast, for instance, is just double that in the West.

Table 28 - Infant and child mortality rates in different regions of Senegal, 1978-1992

Area or region	Infant mortality rate (per 1000)			Child mortality rate (per 1000)	
	1978	1986	1992	1986	1992
Urban	71.3	69.8	54.5	135.4	101.8
Rural	136.8	102.3	86.7	249.6	184.2
West	81.0	72.8	54.0	155.7	110.5
Centre	114.4	93.9	71.9	244.4	170.2
Northeast	135.9	101.4	108.1	199.6	182.7
South	167.3	117.7	97.6	262.2	194.9
National	117.7	91.0	76.0	209.5	156.7

Fisheries

Fishing is carried out in seven of the ten regions of Senegal: Dakar, Thiès, Saint-Louis, Ziguinchor, Fatick, Kaolack and Louga. Fisheries occupy a substantial place in the Senegalese economy, playing a leading role in terms of exports and foreign exchange earnings and were a significant provider of employment and income, particularly in rural areas. Moreover, fisheries contributed 2.4

[25] Differences and trends in polygamy are irrelevant to explaining these changes. It is worth noting that, contrary to popular belief, fertility is lower (other things being equal) under a polygamy regime: women in polygamous unions have on average less children than women of the same age in monogamous marriages.

percent to the GDP of Senegal, and 11.3 percent of the value-added created in the primary sector of the Senegalese economy.

Marine fish production more than tripled between 1960 and 1976. Following the peak of 1976, production declined, and only in 1995 again reached and slightly surpassed the level of production attained in 1976. In 1995, the artisanal fisheries sector and the industrial sector contributed 65 percent and 35 percent, respectively, to the total production. Table 29 shows production statistics for selected years from 1960 to 1995.

Table 29 - Total and per capita fish production in Senegal, 1960-1995

Year	Production of artisanal sector (tonnes)	Production of industrial sector (tonnes)	Total (tonnes)	Per capita production (kg)
1960	79 992	17 209	97 201	32.4
1970	133 466	35 742	169 208	38.5
1976	276 650	74 211	350 861	57.5
1988	237 066	73 624	310 690	45.1
1995	260 900	92 200	353 100	42.0

Until 1976, the increase of fish production had resulted in higher per capita production rates. Because of a temporary drop and stagnation of production, however, and owing to continuing population growth, the per capita availability of fish has declined in Senegal since 1976. The increase in fish production in Senegal was brought about by an increasing number of fishing units, both in artisanal and industrial fisheries. The trend is shown in tables 30-31.

In artisanal fisheries, the number of non-motorized fishing units stagnated and declined from 1991 on. The number of motorized pirogues, however, kept increasing notwithstanding a temporary decline in 1994. As for the number of licensed industrial fishing vessels, it seemed roughly stable around 250 in the mid-1990s.

Table 30 - Number of artisanal fishing vessels in Senegal, 1987-1995

Year	Sailboats	Motorized pirogues	Total
1987	2 246	3 727	5 973
1988	2 413	6 210	8 623
1989	3 510	6 425	9 935
1990	3 889	6 522	10 411
1991	3 920	6 979	10 899
1992	3 552	7 072	10 624
1993	3 652	7 281	10 933
1994	3 058	6 674	9 732
1995	1 535	8 716	10 251

Table 31 - Number of industrial fishing vessels in Senegal, 1993-1995

Year	Trawlers	Tuna vessels	Sardine vessels	Total
1993	187	59	7	253
1994	181	55	3	239
1995	188	55	4	247

Taken together with the information on fish production, the figures show that the catch per unit of fishing effort declined, suggesting that the resources were overfished. The catch per fisher has also declined since 1976, as shown in Table 32.

Table 32 - Catch per fisher in Senegal, 1960-1995

Year	Annual catch (tonnes)	Number of fishers	Catch per fishers and year (kg)
1960	79 992	20 000	400
1970	133 466	27 131	492
1976	276 650	49 001	564
1988	237 066	45 257	524
1995	246 300	51 734	476

Trend in the number of fishers

The number of fishers more than doubled between 1960 and 1983, and reached its peak in 1994. Thereafter, the number of fishers started to decline and dropped to a level last seen in 1986. The trend is summarized in Table 33 below. One sees that, even before reaching its peak in absolute numbers, the category started declining as a percentage of the total population of Senegal.

Table 33 - Fishers in Senegal: number and share of total population, 1960-1997

Year	Number [26]	% of total population
1960	20 000	0.63
1970	27 131	0.65
1980	32 500	0.59
1990	48 122	0.66
1995	51 734	0.62
1997	43 257	0.49

Fisheries resources and the coastal environment

Table 32 shows that, although the number of fishers in Senegal has started declining, the catch per fisher is declining. This seems to indicate overfishing of the resources. In effect, resource assessment studies recently carried out in Senegal confirm that offshore as well as coastal pelagic and demersal fisheries resources were fully and overexploited. In order to conserve and rehabilitate fisheries resources in Senegal, there is an urgent need to limit and reduce fishing effort, along with the number of fishers who exploit the fisheries resources.

Conclusions

Regarding general demographic trends in the Philippines, Malaysia, Bangladesh, India, Tanzania and Senegal, population growth and fertility rates were still high. There are, however, noticeable differences between these countries. In the four Asian countries, population growth and fertility have long begun to decline, and a demographic transition is under way. This is not so in Tanzania and Senegal, where there are only very slight indications of declining fertility and population growth rates.

[26] Source: FAO (1999a).

Regarding quantitative trends in fishing communities, the studies show that, contrary to the global trend, the number of coastal fishers has actually started to decline or stagnate in four of the six countries studied, namely the Philippines, Malaysia, Tanzania and Senegal, while it is still increasing, although to a much lesser extent than in previous decades, in India and Bangladesh.

A probable explanation for these changes might be that in many countries, in the context of declining catches and income per fishers on one hand, and economic growth and rising levels of education on the other, alternative and more economically rewarding employment opportunities had developed outside the fisheries sector, facilitating vocational mobility. Government policies aiming at a reduction and limitation of fishing effort, conservation, and the rehabilitation of fisheries resources could also have played a role in forcing fisherfolk out of their traditional occupation.

The findings of the macro-level studies carried out in the framework of the Project show that in most of the countries studied, fisheries resources were being fully or overexploited, and the state of the coastal environment has deteriorated. The following chapters based on the findings of the household sample survey and focus group discussions carried out by the Project, will examine the above factors and developments in greater detail.

4. SOCIOECONOMIC AND OCCUPATIONAL CHARACTERISTICS OF COASTAL FISHING COMMUNITIES

By U. Tietze

This chapter gives an overview of the socioeconomic and occupational characteristics of coastal fishing communities in the six countries studied based on the findings of the household surveys carried out by the Project. It describes general characteristics of fishing and farming villages, perceptions of the status and management of fisheries resources, occupational status, inter-generational and geographic mobility, income, savings, debts, educational status, housing and infrastructure, political participation, and perception of change in social status.

The Philippines

General characteristics of villages

The five coastal fishing villages or "barangays" and the five neighbouring farming villages studied in the Philippines were randomly selected from 22 coastal barangays in the municipality of Miag-ao in the Ilo-ilo province on Panay island, in the central Visayas of the Philippines.

All five villages were located within eight kilometers from the town of Miag-ao and were accessible by an all-weather road. Their population ranges from 600 to 1 710. The fisherfolk studied were all Catholic. Residents of the five barangays had easy access to public institutions and services such as schools, hospitals, health centres and public markets. Fishing and farming were the main occupations in the villages and some residents, mostly with college degrees, also worked abroad.

Status and management of fisheries resources

Fishers perceived the fisheries resources as fully or over-exploited and noted that the catch per fisherman as well as the variety and the average size of fish caught were decreasing. They also observed that their income from fishing had declined. The fishers clearly perceived three reasons for the overexploitation of fisheries resources. The most important were the increase in their own numbers over the years, the use of illegal fishing methods, such as dynamite fishing, the encroachment of commercial fishing vessels in inshore areas, and the pollution of the sea resulting from industrial and household waste together with the disposal of waste and oil residues from ships.

Following new legislation in the Philippines in support of the conservation, rehabilitation and sustainable management of fisheries resources and coastal environment, Fisheries and Aquatic Resources Management Councils (FARMCs) were being or were established in the villages. None of the five FARMCs was yet in a position to control and prevent illegal fishing in municipal waters. Fishers felt that they needed training and support from Government authorities to be able to monitor fishing activities in municipal waters, and to assist in the enforcement of existing regulations.

Occupational status, inter-generational occupational and geographic mobility

The occupational status of male household members of reproductive age in fishing and farming households was clearly determined by fishing and farming as the main economic activities. Subsidiary occupations were equally common among fishers and farmers. About 42 percent were involved in farming in the fishing villages, and cattle herding and fishing in the agricultural villages.

Few women of reproductive age were involved in income earning activities, both in fishing and farming villages. About nine percent of the women in fishing villages were involved in fishing or fish marketing, while another five percent were involved in retailing, services and cattle herding. In the farming villages only four percent of the women were involved in income-generating activities: farming, services or fish marketing.

Half of the fisherfolk households owned fishing boats, while another eight percent shared boats with other households, generally planked canoes and outrigger boats with or without outboard motors. Six percent owned planked canoes with inboard motors. A total of 79 percent of all fisherfolk households owned fishing gear, most commonly handlines, beach seines, pelagic longlines and gillnets. The main fishing seasons were January-May and October-December. During the typhoon season, which lasts from June to September, fishing is also carried out, but on a reduced scale.

The vast majority of fishers (72 percent) and farmers (80 percent) were uncertain as to the future prospects of their profession. However, more fishers (23 percent) than farmers (16 percent) had a positive outlook. Few fishers and farmers (about four percent in both cases) had explicitly negative outlooks. When asked whether they would advise their children to take up the same profession as their fathers, 43 percent of the fishers and 38 percent of the farmers responded by the negative. Only 30 and 32 percent, respectively, would advise their sons to take up their profession.

Inter-generational occupational mobility can be assessed by comparing the respondents' occupations with that of their fathers. It is interesting to note that while 66 percent of the male household members of reproductive age were presently involved in fishing as a full or part-time activity, only 48 percent of their fathers were involved. While other economic activities in the field of agriculture, services, etc. presently hardly played any role, 20 percent of the fathers of the male household members interviewed had been involved in farming as a full-time or part-time activity.

These findings bring forth two significant developments, namely (1) that in the fishing villages studied, the importance of fishing as compared to farming has certainly increased as an economic activity, and (2) that there has also been an occupational shift from farming into fishing. In comparison, no such occupational shift can be observed in the farming villages.

Geographic mobility was a significant factor in the communities studied. This was the case in both fishing and farming villages. There did not seem to be any significant differences between fishing and farming villages, although the percentages were slightly higher for respondents in farming villages. In both cases more than three fourths of all male household members grew up in the same municipality where they presently live. Eighty percent of all male household members of reproductive age in fishing villages, and 83 percent in farming villages, had grown up in the same province, while the balance had migrated there from other provinces.

The geographic mobility of the female household members of reproductive age in both fishing and agricultural villages was even greater than the mobility of the male household members. Significantly, fewer women than men had grown up in their present villages of residence, because when women marry, they usually leave their homes to reside with their husbands.

Income, savings, debt

Fisherfolk households in the municipality of Miag-ao were significantly better off financially than farming households. The findings show that fisherfolk households perceived their financial situation as superior to farming households. However, only 53 percent of fisherfolk households considered their financial situation adequate, compared to 33 percent of farming households.

The above assessment reflects the differences between the total household incomes of fisherfolk and farming households. The most common annual income bracket (31 percent of fisherfolk households) was that between 20 000 and 30 000 Pesos (P.), followed by that between P.10 000 to 20 000. About 10 percent of the fisherfolk households fell into the higher and lower income brackets of P.30 000 to 40 000 and P.1 000 to 10 000, respectively. The income of farming households was considerably lower: 32 percent earned P.1 000 to 10 000, 27 percent P.10 000 to 20 000, and 17 percent P.20 000 to 30 000.

Nineteen percent of fisherfolk households regularly saved money, only slightly higher than farming households, with 17 percent. The amounts saved, however, were significantly higher in fishing than in farming households.

There was only a small difference between the percentage of debt in fisherfolk households (62 percent) and farming households (66 percent). The amount of money borrowed over the last 12 months, however, seems to be higher in farming villages than in fishing villages.

Educational status

Rates of school enrolment were similarly high in fishing and farming villages. In fishing villages, 98 and 99 percent of males and females of reproductive age had attended school. In farming villages, 96 percent of the men and 100 percent of the women interviewed had attended school.

Women in both types of villages attained a higher level of education than men. Women in farming villages had a significantly higher level of education than in fishing villages, while there was hardly any difference between male fishers and farmers. In farming villages, almost a quarter of women of reproductive age had a college degree and 56 percent had completed secondary education. In fishing villages, 11 percent of women of reproductive age had a college degree and 47 percent had completed secondary education. In fishing and farming villages 13 and 11 percent of the men, respectively, of reproductive age had a college degree, and 29 and 31 percent had completed secondary education.

Housing and infrastructure

Almost all the households in the fishing and farming villages studied, i.e. 95 and 96 percent, respectively, owned the houses in which they lived. The farmers' houses seemed to be larger, however, than the fishers'. Many of the farmers had houses that were also more solidly built than the fishers', with cement walls and floors and metal roofing. Fishers' houses frequently had wooden walls with thatched and clay roofs and earthen floors.

Infrastructure and facilities, such as water supply, electricity, roads, public transport and medical services can be considered satisfactory: there were no major differences between fishing and farming villages. More than half of the households had a piped-in water supply; the second most important source of water were tube wells. Wood was generally used for cooking.

Political participation

In all the fishing villages surveyed, fishermen and women were actively involved in social and religious groups, professional associations and political parties. These included fishers and milk fish fry catchers' associations, multi-purpose cooperatives, Catholic women's organizations, fisheries and aquatic resources management councils, small fishers' associations, credit cooperatives, various

social groups and various political parties. Farmers were equally involved in social and religious groups, professional associations and political parties.

Fisherfolk and farmers kept themselves regularly informed through mass media such as television, radio and newspapers, radio being the most popular. Ninety-four percent of the men and 98 percent of the women in fishing villages listened to the radio regularly, as well as 86 percent of the men and 99 percent of the women in farming villages. Television came in second: between 80 percent and 86 percent of the women and men in the fishing and farming communities regularly watched TV. Daily newspapers were regularly read by between 42 percent and 63 percent of the women and men in the fishing and farming communities.

Perception of change of socioeconomic status

The focus group discussions conducted by the Project showed significant inter-generational differences, while hardly any gender difference could be found in the perception of whether and how the socioeconomic status of fisherfolk has changed over past decades.

Older fishers (55-65 years) perceived a significant overall improvement of their socioeconomic status brought about through higher incomes. This included ownership of durable consumer goods such as radios, television sets, video cassette players, electric fans, refrigerators etc., more durable and improved standards of housing, better health services and social security, greater participation in political decision making and better and more diversified employment opportunities. Women of the same age group perceived the same positive changes as their male counterparts. The women added to the above the improvement in nutrition and food, attributes that people today also understand better.

Younger fishers (25-35 years) also saw an improvement in income and in employment opportunities, observing that people today live more comfortable lives than in the past. Unlike the older generation, however, they also perceived negative changes. These included the observation that the cost of living has considerably increased over the years and that fishing as the sole occupation can no longer meet these costs. Young fishers point out, for example, that in the past wood was used for building houses and boats or as fuel and it was available free or at low cost. Today, this is no longer true. Materials for house construction and fuel had to be purchased and, in order to meet higher expenditures, fishers were forced to take up secondary occupations or change their occupation altogether. Their wives also had to engage in income earning activities. Young women of the same age group perceived the same changes as their male counterparts. They stressed that those who engage in income earning activities do this at their owned volition; their preferred economic activities were the running of a small grocery store ("sari-sari") and fish marketing.

Malaysia

General characteristics of villages

The five fishing and five neighbouring farming villages or "kampungs" studied in Malaysia were located in the state of Kedah on the northeastern coast. Two of the villages were in northern Kedah, in the district of Kubang Pasu and two were in the southern administrative district of Kota Setar. The remaining six were in the more densely populated central area of Malaysia, in Kuala Kedah. All the villages were well served by roads and transportation systems and, according to key informants, health and family planning services were widely available.

The population of the fishing villages ranged from 200 to 1 800 and that of the agricultural villages from 200 to 1 000. All the villages were established more than 50 years ago. All fisherfolk households selected for the study in Malaysia were Muslim.

The distance from the fishing villages to the nearest town ranged from 1 to four kilometers. The distance from the agricultural villages to the nearest town ranged from one to seven kilometers. All the villages could be reached by an all-weather road and had public transport, i.e. bus and taxi services. With the exception of one agricultural village, all the villages had primary and secondary schools within three kilometers or less. Medical services were also within reach.

Status and management of fisheries resources

The opinions of fishers on the status of fisheries resources and on the coastal environment seemed divided. About half of the fishers interviewed were satisfied with the state of the coastal environment, the other half were not. More than half (57 percent) of the fishers agreed that the seawater quality has seriously deteriorated owing to pollution caused by ships, industrial waste, sewage and household waste. It is interesting to note that many more women than men recognized a pollution problem.

In assessing fish stocks, the largest subgroup (45 percent) was undecided. More than a third of the fishers (36 percent) were satisfied, while only less than a fifth (19 percent) were dissatisfied. A similar pattern emerged in response to the question of whether the state of fisheries resources has deteriorated because of an increasing number of fishers and fishing boats. Slightly less and slightly more than half of the fishers interviewed, respectively, agreed with the assertion that the total catch and the variety of fish caught had seriously declined, owing to the increasing number of fishers and fishing boats.

As in the appraisal of seawater pollution, women were more critical in their evaluation of the state of fisheries resources. Respectively, 61 and 58 percent, agreed that the total catch and the variety of fish caught had seriously declined owing to an increasing number of fishers and fishing boats.

Regarding the management and conservation of fisheries resources and the coastal environment, more than four fifths of both fishers and women agreed that strict rules should be introduced to regulate the fishing effort. It is interesting to note that only 56 percent of both the men and women thought that adequate steps had been taken by the Government for the conservation and protection of the coastal environment.

Occupational status, inter-generational occupational and geographic mobility

Fishing is clearly the main economic activity in the five fishing villages studied and other economic activities only contributed in minor part to the total household income. The reverse was true in the five agricultural villages where farming is the dominant economic activity.

Ninety-seven percent of the heads of households in the fishing villages were involved in fishing. Considering the occupations of all individual household members of reproductive age, more than two thirds (69 percent) of the male household members fished as a main occupation while 19 percent were unemployed. Only less then 10 percent of the male household members of reproductive age had a main occupation besides fishing.

Secondary occupations were not very common in fishing villages. Less than one fifth of all the male household members of reproductive age were involved in secondary occupations. Seven percent of

male household members of reproductive age were involved in farming as a secondary occupation and only one percent, in retailing. The remaining 11 percent were involved in unspecified, often transitory secondary occupations.

While none of the female household members of reproductive age in the five fishing villages had fishing as her main occupation, 15 percent only were employed outside the fisheries sector. The vast majority was unemployed.

In terms of employment, the five agricultural villages studied in Malaysia were less homogenous than the fishing villages. The percentage of the male household members whose main occupation lay outside farming or who were unemployed was considerably higher than in the fishing villages. Significantly, more male household members were involved in secondary occupations outside farming, mostly in unspecified and often transitory activities, followed by fishing, retailing and fish marketing.

Unemployment of women of reproductive age in agricultural villages was slightly lower than in fishing villages. Women were also more frequently involved in secondary occupations.

In fishing villages, less than half of the households (40 percent) owned a fishing boat. Another four percent owned a boat jointly with other households. The remaining households provided crew members for fishing boats owned by other households. Gillnetting was the most common fishing method practiced in the fishing villages, followed by trawling, purse seining, beach seining and stake net fishing. The boats owned by fishers consisted of planked canoes, purse seiners and trawlers.

Fishermen and women were rather pessimistic regarding the future of their occupation. None of the various subgroups (older and younger fishermen, older and younger fisherwomen) wanted their children to become fishers. Fishermen and women indicated the risks and hardships associated with fishing and saw their occupation as unrewarding economically when compared with other employment opportunities.

There were, however, differences between older and younger fishers and between men and women in their views on the present situation. Younger fishers between 25 to 35 years of age were generally satisfied with their occupation believing their relatively low level of education limited their access to other employment opportunities. Their occupational aspirations were to own their fishing craft and gear. The younger women in the fishing communities in Malaysia, however, did not share the satisfaction of the younger fishermen with their occupation and stressed the risks, hardship and relatively low income associated with fishing.

Fishers aged 55 years or older saw their situation more negatively. They compared it with their past when catches, income and socioeconomic status were higher than other social groups in rural Malaysia. Women 55 or older, on the other hand, accepted fishing as the principal occupation of their families as it has traditionally provided income and employment. They realized, however, that once educated, their children preferred occupations outside fisheries.

Information collected on inter-generational occupational mobility suggests two significant developments, namely (1) that in the fishing villages studied, the importance of fishing as compared with farming has decreased as an economic activity and (2) that there has also been an occupational shift from fishing to other economic activities. While 69 percent of the men of reproductive age in fishing villages were involved in fishing, 80 percent of their fathers were fishers. It may be noted

that the trend observed in Malaysia is just the opposite of that found in the Philippines, where over the last generation people have moved into fishing from other occupations.

The trend of inter-generational occupational mobility out of traditional occupations in the primary sector into non-traditional occupations in other sectors of the economy is even more pronounced in the agricultural villages studied. Only 55 percent of the men of reproductive age in the agricultural villages were involved in farming, against 93 percent of their fathers.

Income, savings, debt

More than 80 percent of fisherfolk and farmers perceived their financial situation as sufficient while 19 and 17 percent, respectively, perceived their situation as barely sufficient or insufficient. There were no major differences of perception between fisherfolk and farmers although four percent of the respondents in fisherfolk households perceived their financial situation as more than sufficient, while none of the farmers holds this view.

The findings suggest that the actual average annual income is significantly higher in farming households (Ringits 11 546) than in fisherfolk households (Ringits 6 438). The higher incomes of farmers was also apparent in the more frequent ownership of durable household goods and communication facilities, such as refrigerators, telephones, television sets, generators, etc.

The relative affluence of farmers compared to fishers is also apparent in their savings and borrowing practices. While there is little difference in the percentage of households that saved (20 percent in fishing villages and 22 percent in agricultural villages), there were big differences in the amounts saved. Farmers saved considerably more than fisherfolk. The main motives for the savings both in fisherfolk and farmers' households were to provide social security and for the children's education.

Educational status

The educational status of fisherfolk is generally lower than that of farmers in the Malaysian villages studied. There were also gender-specific differences. In fishing villages women showed slightly higher educational achievement than men. It was the other way around in agricultural villages, where men showed higher educational achievement than the women.

In agricultural villages, 59 percent of men and 57 percent of women of reproductive age completed secondary education. The corresponding figures for fishing villages were 45 percent and 49 percent, respectively. Fifty-two percent of the men and 45 percent of the women in fishing villages and 30 percent of men and 34 percent of women in agricultural villages only had completed primary education.

College or university degrees were obtained by as many as six percent of the men and four percent of the women in farming villages, and only three percent of the women and one percent of the men in fishing villages. The case of not having attended school at all was rare. However, absence of schooling concerned four percent of women and two percent of men in farming villages, and one percent of women and men in fishing villages.

Housing and infrastructure

With the exception of three fishers households, all fishers and farmer households owned the houses in which they lived. Farmers' houses, however, were more solidly built than fishers' houses. Most fisherfolk houses had wooden walls and floors (64 percent), while most farmers' houses had brick

walls (43 percent) or cement (28 percent). Fisherfolk houses were usually built on wooden stilts close to rivers and the sea.

Regarding facilities and infrastructure such as sources of water and energy, hygiene, public infrastructure and transport, medical services, etc., there were no major differences between the houses of fishers and those of farmers in the Malaysian villages. More than 92 percent of the households used gas for cooking, and more than 98 percent of houses had indoor plumbing.

Political participation

A number of social and professional organizations operated in the fishing villages. All the fishing villages had fishers' associations with membership ranging from 100 to 800 members. Two villages also had fishers' cooperatives with membership from five to 100 fishers. Four fishing villages had welfare associations with membership from 50 to 800 members, and one fishing village had a youth organization. Agricultural villages had fewer professional and community organizations than fishing villages.

Fisherfolk in the villages studied kept themselves regularly informed through mass media. Almost all households in both fishing and farming villages read daily newspapers and had radios. More than half of all fisherfolk and farmer households owned television sets. Others watched television in their neighbours' houses or in coffee shops and eating stalls.

The community development agency (Kemajuan Masyarakat) carried out various youth and adult education programmes in the villages focusing on handicrafts, tailoring and cooking. The family planning associations and population development board carried out programmes in the field of health and childcare and family planning.

Membership in political parties was more common in fishing villages than in agricultural villages. All the fishing villages and most of the farming villages contained branch offices of the main political parties. More than half of the fisherfolk in all fishing villages were members of political parties. In one agricultural village, no one belonged to a political party, while in the other agricultural villages, the membership ranged between 10 to 50 percent.

Perception of change in socioeconomic status

Both women and men belonging to the older and younger generation in fishing as well as in farming villages saw definite improvements over the years in their socioeconomic status, level of education, public services, health services and facilities, social security etc.

There were no major generational or gender differences between the perceptions of the men and women and both fishing and farming communities observed that although incomes had increased, inflation and the higher cost of living and production had partly eroded the gains.

Bangladesh

General characteristics of villages

Bangladesh has a coastline of almost 500 kilometers in length. Administratively, the coastline is divided into five so-called "greater districts": Khulna, Patuakali, Barishal, Noakhali and Chittagong. Of the total marine fisherfolk population, more than three fourths live in the latter two districts and of these, the majority is settled in Chittagong.

Four fishing and four neighbouring farming villages were selected from the greater Chittagong district in the eastern part of the country. The first village is located in the northern part of the district, the second and third were in the central part, and the fourth village is in the southern part of the district. The fifth fishing and farming villages were located in the Noakhali district in south-central Bangladesh.

The majority of the households selected for the study were Hindus of the Jaladas (Sudhra) caste, one of the lowest ones. A few were Sunni Muslims.

The fishing and farming villages studied in Bangladesh were located within 10 kilometers from their administrative, i.e. "thana" headquarters, where there were facilities such as hospitals. All-weather roads connect all the villages and the thana headquarters can be reached by bus or other public transport within an hour. Educational institutions such as primary and secondary schools, post offices, maternity and child health centres, village markets and bus stops were within half an hour by foot from the villages.

In each thana there was one hospital and in each "union" there was one Maternity and Child Health (MCH) centre. Villages within unions were served by village level workers, known as "Family welfare assistants of the department of family planning". In addition to the traditional birth attendants (TBAs), these people take care of primary health services and in most places supply oral contraception and condoms free of charge and readily available to (married) villagers. The practice of traditional means of contraception was almost non-existent in the communities studied.

Three of the fishing villages studied were quite small with a population of between 225 and 355 inhabitants. The other two were larger, having a population of 1 200 and 2 500. Most farming villages had larger populations than fishing villages. Three farming villages had populations of between 600 and 650 inhabitants, and the other two had 1 200 and 2 167 inhabitants. All villages were established more than 50 years ago.

Fishing and farming, respectively, were the predominant economic activities. Secondary occupations and diversification of employment were more frequently found in farming than in fishing villages.

Status and management of fisheries resources

The overwhelming majority (between 82 and 89 percent) of male and female fisherfolk in Bangladesh was aware that because of an increasing number of fishers and fishing boats over the last few years, the total catch had seriously declined and the variety and size of fish caught had decreased. More than two thirds also held the view that over the last few years the quality of the seawater had seriously deteriorated owing to industrial waste, household waste and sewage and because of pollution from ships.

While more than four fifths of the fisherfolk supported the view that strict rules should be introduced to regulate fishing effort, only a minority was convinced that the Government took adequate steps for the conservation and protection of fisheries resources and the coastal environment.

Occupational status and inter-generational occupational mobility

Fishing and farming were clearly the dominating economic activities in the fishing and farming villages, respectively, studied in Bangladesh. Ninety-eight percent of the male household members of reproductive age in fishing villages, and 97 percent of their counterparts in agricultural villages were involved in fishing and farming as the principal economic activity, respectively. Secondary occupations were more common in farming than in fishing villages and included salaried employment, small businesses and farming. Few female household members of reproductive age were involved in income-generating activities: only 10 percent in fishing villages and six percent in farming villages.

While almost all male household members of reproductive age in fishing villages and farming villages were involved in fishing and farming as the major income earning activity, this was true of only about 80 percent of their fathers in fishing households and about 70 percent in farming households. The figures suggest that in the coastal areas studied in Bangladesh, there has been an occupational shift into fishing and farming over the last generation.

Regarding the ownership of production assets, less then half of all the households studied (44 percent) owned one or, in some cases, two fishing boats. In addition to the boats they owned, these households also leased fishing boats. Of the remaining 56 percent of the fishing households, several had a share in a boat owned by another household. More than two thirds of the households owned fishing gear. Less than one third of the households owned neither fishing boats nor gear and worked exclusively as fishing crew.

The fishing methods employed included gillnet fishing, trawling, purse seining, beach seining, lift net fishing, scoop net fishing, trolling, bottom long line fishing and handlining. A wide variety of fishing boats was used: log rafts; outrigger boats; planked canoes with inboard or outboard motors and sails; and trawlers.

Fishing was carried out in the open sea as well as close to the shore and in estuaries. Marine capture fisheries were usually practiced from October to April while estuarine fishing was practiced during the remaining part of the year. There are three fishing seasons: the peak season from July to October, the normal season from November to February and the lean season from March to June.

Concerning the future prospects of their industry, most fisherfolk had a rather negative outlook. This was related to the overexploitation of fisheries resources as well as to the fact that marine fisherfolk in Bangladesh, because of their religion and culture, were isolated from the mainstream of society and also do not participate in local politics. They felt particularly disadvantaged, indicating that local fish merchants who dominate the marketing of fish give them very low prices. Most fishers interviewed stated that they would like to leave the fisheries sector, but there are no other employment opportunities. This is also because of their low levels of education.

Income, savings, debt

Comparing fishing and agricultural villages, it is interesting to note that the income of fisherfolk in Bangladesh was significantly higher than the income of farmers living in neighbouring villages. The average per capita annual income in fisherfolk households was Taka 9 408, while the average per capita annual income in farming households was only Taka 6 615. Twenty-five percent of the fisherfolk households studied fall into the highest income category, i.e. households with an annual income of Taka 80 000 and above, while only 14 percent of the farming households fall into this category. More than one third of the farming households fall into the lowest income category of

those whose annual income was below Taka 20 000, while only 19 percent of fisherfolk households fall into this category.

As mentioned above, fishing and related economic activities were clearly the prevailing occupations in the fishing villages and accordingly account for 88 percent of the total income of fisherfolk households. About five percent of the total household income was earned by wage labour, two percent by farming, two percent by small businesses, one percent by salaried employment and the remaining two percent by other economic activities.

In the neighbouring farming villages studied, employment was more diversified and less homogeneous than in fishing villages. Thus, farming, livestock and small agro-businesses only contribute 68 percent to the total household income. The remainder was earned by wage labour (11 percent), salaried employment (7 percent), fisheries related businesses (6 percent), and other activities (eight percent).

The better economic situation of fisherfolk households as compared to farming households was reflected in higher rates of savings (31 percent vs. eight percent) and in the higher amounts saved (Taka 16 050 vs. Taka 9 522).

The differences in the financial situation of fisherfolk and farming households were reflected in the subjective assessment of their financial situation, which was overall rather negative. Almost half of the farming households considered their income as insufficient as compared to only one third of the fisherfolk households.

Educational status

The level of education in farming villages was significantly higher than the level of education in fishing villages. In both types of villages, the level of education of males was higher than that of females. More than three fourths of the men in the farming villages studied completed primary school, compared to only 57 percent of the men in fishing villages. The corresponding figures for women were 63 percent and 47 percent, respectively.

While 13 percent of the men and two percent of the women in the farming villages completed secondary school, only four percent of the men, and none of the women in fishing villages did. Although fisherfolk in Bangladesh seemed aware of the importance of education for social status and occupational mobility, as a social minority, they perceived cultural and religious barriers in their access to educational institutions. This may be a significant factor contributing to the lower rate level of literacy and education.

Housing and infrastructure

Almost all fisherfolk and farmers owned their homestead. Although the average income of fisherfolk households was about 40 percent higher than that of farming households, the housing conditions of farmers in Bangladesh seemed slightly better. While the average number of rooms per household was the same, farmers' houses were more solidly built with tin rather than thatched roofs. Five percent of the farmer households lived in brick and/or cement houses, compared to only one percent of the fisherfolk households.

Political participation

Political participation of marine fisherfolk in Bangladesh was negligible. Hardly any of the fisherfolk interviewed for the study were members of a political party or participated in local government. The fact of belonging to the lowest Hindu caste in a Muslim society seemed to exclude them de facto from political participation. In the neighbouring farming villages, however, many of the people were members of political parties and participated in political activities.

In both fishing and farming villages, the use of mass media was not very common. This reflects the relative social isolation and lack of political participation of rural communities in Bangladesh, as compared to the Philippines and Malaysia. Only one percent of fisherfolk and farmers read daily newspapers, and only two percent of fisherfolk households and four percent of farmers' owned television sets. However, 32 percent of fisherfolk households and 28 percent of farming households, owned radios – mostly to listen to weather forecasts.

Perception of change in socioeconomic status

Marine fisherfolk in the villages studied in Bangladesh perceived their socioeconomic status as extremely low. This is related to the above-mentioned fact that most of them belong to the lowest Hindu caste in a society dominated by Islamic culture. Fisherfolk, in particular, felt that they were excluded from participating in political decisions regarding local government and administration and that they were being exploited by local fish merchants, moneylenders and other economically and politically influential groups.

Compared to the past, fisherfolk felt that their socioeconomic status had not improved much, although progress in educational standards and health care were noted. This was largely attributed to the work of NGOs. Fisherfolk encouraged children with an education to raise their social status by finding jobs outside fisheries, i.e. in service industries, small businesses, etc.

India

General characteristics of the villages

The fishing and farming villages studied in India were located in Thane district, on the West coast, in the state of Maharashtra. The fishing villages were between three and 15 kilometers from the nearest urban centre. Two of the fishing villages were in a rural area, the other three were close to towns. The agricultural villages were all close to the fishing villages.

Two of the fishing villages were part of larger municipalities, while the others were independent communities. The population of the villages and municipalities ranged from 3 500 to 15 000 inhabitants. The farming villages were independent and smaller with 1 100 to 10 000 inhabitants.

Slightly less than one fourth of the fisherfolk households studied were Christians and slightly more than three fourths were Hindus. In the agricultural villages only 14 percent were Christians while 86 percent were Hindus.

Some of the fishing villages had better facilities and infrastructure than the neighbouring agricultural villages, which could be because they were larger.

All the fishing villages were connected by all-weather roads. Public transport was available in the form of buses and auto-rickshaws. Four out of five of the farming villages were also connected by all-weather roads, and had the same public transport as the agricultural villages.

In both fishing and farming villages, primary and secondary schools were either in the village or within two kilometers. The municipality of one fishing village had a college, while the other nine villages were within three to 16 kilometers from the closest college.

All the fishing villages and three of the agricultural villages had social and professional organizations such as youth clubs, women's organizations, cooperative societies and banking facilities. Two of the farming villages had no banking facilities. Three of the fishing villages had postal and telecommunication facilities in the village, while the other two had them within two kilometers. None of the agricultural villages had post or telecommunication facilities, but these were available at a distance of two to four kilometers. Four of the fishing villages and four of the agricultural villages had food stores and village markets.

Health care facilities were either available in the fishing and agricultural villages or close by. All the fishing villages had medical doctors and three of the villages also had pharmacies. The other two villages had pharmacies within a distance of two kilometers. Two of the fishing villages had primary health centres, as well as mother and child health and family planning clinics. Three of the villages had these facilities within four and two kilometers. Two of the fishing villages had a hospital, while the other three villages were within two to 12 kilometers from the nearest hospital.

While the farming villages had fewer medical facilities then the fishing villages, only three of them had medical doctors and only two had pharmacies. Only one of the farming villages had a primary health centre, a mother and child health and family planning clinic and a hospital. The other villages were a distance of three to 10 kilometers from these facilities.

Although there were various medical facilities in or close to the villages, hygienic and sanitary conditions were extremely poor in both fishing and farming villages. There were no systems or arrangements for sewage and garbage disposal. In the fishing villages studied, the hygienic and sanitary conditions were worse than those in the agricultural villages, because the fishing villages were larger and more congested. Drinking water was mainly drawn from public wells and hand pumps and few households (more so in fishing than in farming households) had indoor plumbing.

Status and management of fisheries resources

Men and women in Indian fishing villages were well aware of the overexploitation of fisheries resources and the deterioration of the coastal environment. Ninety-six percent of the men and 91 percent of the women of reproductive age agreed that the total catch over the past few years has declined because of the increasing number of fishers and fishing boats. More than 85 percent of the men and 76 percent of the women further agreed that the variety and size of fish caught had also declined. Eighty-two percent of the men and 75 percent of the women thought that the quality of the seawater had deteriorated as a result of industrial waste, sewage, household waste and pollution from ships.

With the intention of halting the decline of fisheries resources and the degradation of the coastal environment and to improve the situation, more than three fourths of the men and two thirds of the women demanded that strict fishing regulations be introduced. Only a small minority (between five and seven percent of the men and women), believed that the Government had taken adequate steps for the conservation and protection of fisheries resources and the coastal environment.

Occupational status, inter-generational occupational and geographic mobility

While fishing was still the most important occupation in the fishing villages studied, service sector jobs also played a substantial role. Only 70 percent of the men of reproductive age living in fisherfolk households had fishing or related activities such as fish marketing or boat building as a main occupation, while 30 percent were employed in the service sector or involved in other economic activities. Almost all the women of reproductive age in the fishing villages studied in India were involved in fish marketing and processing.

Subsidiary occupations were common in agricultural villages, but almost negligible in fishing villages. Fifty-nine percent of the men and 29 percent of the women in agricultural villages had subsidiary occupations, most commonly farming, compared to only three percent of the men and 13 percent of the women in fishing villages.

Comparing the main occupations of sons with their fathers, an inter-generational occupational shift out of fisheries into service industries is apparent. Eighty-seven percent of fathers were still involved in fishing, fish marketing, processing and boat building as a main occupation, while only 13 percent were involved in the service sector or other economic activities.

In contrast to their husbands, fish marketing and processing had become a more important economic activity for women of reproductive age in fishing villages. Their mothers had been involved to a lesser extent, only about two thirds had been involved in fisheries, mainly in fish marketing and processing.

In the neighbouring farming villages, people had moved out of their traditional occupation to a much larger extent than in the fishing villages. Only one third of all the male household members of reproductive age were still involved in farming or horticulture as main economic activities, while two thirds worked in the service sector (more than a third), in retailing or elsewhere. As in fishing villages, the traditional occupation in farming villages was still being carried out by the women, of whom 88 percent were still involved in farming and horticulture, while another seven percent were employed in the service sector, in retailing and elsewhere.

Inter-generational occupational mobility was more pronounced in the agricultural villages than in the fishing villages. The employment of men in agriculture drastically declined, compared with their fathers, and the overall employment of women in agriculture had considerably increased.

While considerable inter-generational mobility can be observed in fishing and in agricultural villages, geographical mobility was negligible. Ninety-six percent of the men of reproductive age in the fishing villages studied and all their counterparts in the agricultural villages were living in villages where they were born. The percentages of female fisherfolk and their counterparts in agricultural households born in their same villages were lower, i.e. 74 percent and 62 percent, respectively, owing to the custom that wives move to their husbands' homes after marriage.

One third of the households in the fishing villages owned one or perhaps two fishing boats and another four percent shared ownership. Planked canoes with inboard engines (78 percent), were the most commonly used boats, followed by outboard motor planked canoes (16 percent) and dugout canoes with no motor (5 percent).

Fifty-four percent of all fisherfolk households owned fishing gear and another four percent shared ownership. The most common gears were fixed nets (dole nets) owned by 61 percent of the

households and gillnets owned by 35 percent of the households. Trawlnets, handlines and liftnets were only owned by a few households. The main fishing season spans from August to May.

Fishers in the Indian fishing villages studied had a rather negative perception of their occupation. Only about one third considered their occupation beneficial, while two thirds considered their occupation not beneficial. The opinions of women in the fishing villages studied were divided evenly: half deemed it beneficial, the other half, not beneficial.

Decline of catches, low earnings and increasing costs of inputs were the main reasons why the men and women in fishing villages considered their occupation to be no longer beneficial. Those who still found fishing a generally beneficial occupation highlighted the increasing market prices for fish, low investment costs, the regular income that fishing provides, as well as the fact that no formal qualifications or educational degrees were needed to enter the profession.

Regarding fishing as a future occupation for their children, the views of men and women alike were negative. Only 38 percent of the men and 34 percent of women in fishing villages would want their children to take up fishing as an occupation[27]

In the agricultural villages studied, women had a more negative outlook than their counterparts in fishing villages regarding the benefits and future prospects of the traditional occupation. Men in agricultural villages, on the other hand, had a more positive outlook than their counterparts in fishing villages. Two thirds of the women in agricultural villages had a negative perception of farming, while 45 percent of the men saw their occupation overall, as beneficial.

Income, savings, debt

The average annual household income of Rupiah (Rs) 46 400 was higher in the fishing households studied than in neighbouring agricultural village households that earned an average of Rs 42 500. Seventy-eight percent of the fisherfolk households' income was generated by fishing and fisheries related activities, against only 39 percent in agricultural villages generated by farming and related activities. The major part of farmers' income was generated by employment in the service sector and wage labour.

Although the income was lower, saving was as widespread in agricultural villages as in fishing villages. In both categories, slightly less than 40 percent saved regularly. As in the case of income, the average amounts saved in fishing villages were Rs 7 710 – higher than those in agricultural villages (Rs 7 350). Among the reasons and purposes for saving money, buying and replacing of household goods were the highest priorities in both types of villages, followed by social security and children's education. A noticeable difference between fishing and agricultural households was that fisherfolk mostly saved money for productive investments. More than three fourths of fisherfolk and farmer households kept their savings in a bank.

Households in fishing and agricultural villages also borrowed money. Loans obtained by fisherfolk households amounted to an annual average of Rs 24 900, which was higher than in agricultural villages: (Rs 20 600). The average annual repayment of Rs 10 800 was also higher in fisherfolk

[27] It is interesting to note the a study of marine artisanal fisherfolk in the eastern and less developed Indian state of Orissa carried out more than 15 years ago, i.e. in 1983/84 when fisheries resources were less exploited, had quite similar findings on the outlook of fishermen regarding the future of their trade. Only 40 percent of fishermen had an optimistic outlook, while the rest were pessimistic or indifferent. There were, however, considerable differences between boat owners and labourers on fishing boats, the latter ones being much more pessimistic than the former ones. See Tietze (1985: 124).

households than in agricultural villages, which repaid Rs 3 540 per year. The most significant reasons for taking out loans in fishing villages, as well as in agricultural villages, were productive investments, followed by daily needs. The most significant loan sources in fishing villages were relatives and friends, followed by banks and cooperatives; traders were of minor importance. In agricultural villages, banks and cooperatives were by far the most significant sources of loans, followed by relatives and friends.

Educational status

Educational standards of men in fishing villages were higher than their counterparts in agricultural villages. Women in agricultural villages had higher levels of education than women in fishing villages. Fifty-seven percent of the men in fishing villages had completed secondary education, 33 percent, primary education, and two and one percent, respectively, vocational training and college. In agricultural villages, only 50 percent had completed secondary education and 48 percent primary education.

Fifty-four percent of the women in agricultural villages had completed secondary education and four and six percent, respectively, had completed vocational/technical training and college. The remaining 36 percent had completed primary school. In the fishing villages studied, 50 percent of the women had completed secondary school and 48 percent, primary school.

Housing and infrastructure

All the households in agricultural villages and 93 percent of the households in fishing villages owned the house in which they lived. Fisherfolk houses had 2.8 rooms, slightly larger than agricultural village houses: 2.5 rooms. However, sanitary facilities and drinking water were better in agricultural village houses.

Most of the houses in fishing and agricultural villages were solidly built and had brick or cement walls, cement, brick or tin roofs and brick or cement floors. More farmers' houses had their own water supply than fisherfolk houses. Only 51 percent of agricultural village households depended on public wells or water taps, against 79 percent of fisherfolk households. The remaining households had indoor plumbing. Forty-two percent of farmers' houses had their own, or shared flush toilets, against only 11 percent of fisherfolk houses.

Political participation

As mentioned above, both fishing and agricultural villages had a number of social and professional organizations. The use of mass media was very common and even more so in fishing villages than in agricultural villages. About 87 percent of the men in fishing villages and 66 percent of the women regularly read newspapers. The corresponding figures for agricultural villages were 75 and 55 percent. Seventy-three percent and 67 percent of the men and 60 and 67 percent of the women in fishing and agricultural villages, respectively, regularly listened to the radio.

Fisherfolk and agriculturists in the villages studied frequently belonged to political parties and participated in political activities. In some of the villages studied, close to half of the respondents belonged to political parties, while in most of the other villages about one tenth of fisherfolk and farmers belonged to a political party. The participation of women in political matters was, however, very limited. By law, women were not allowed to become members of cooperatives. They also had little say in village affairs.

Perception of change in socioeconomic status

Fisherfolk and agriculturists both felt that their socioeconomic status had considerably improved over the years, compared that of their parents. This was above all related to improvement in income, educational level and facilities, health and health facilities and nutrition and food security. They also noted the change in family structure from joint to nuclear families, and today's reduced family size. Among the negative trends fisherfolk and agriculturists highlighted were more congested housing conditions and deteriorating sanitary and hygienic conditions.

Tanzania

General characteristics of villages

In Tanzania, only three fishing villages and two agricultural villages were studied. The villages were located in the southern part of Bagamoyo district, one of six coastal districts of Tanzania. Villages in northern Bagamoyo district were considered too remote and difficult to reach.

Two of the three coastal fishing villages were small (populations of 1 341 and 1 847, respectively), while the third village had about 4 000 inhabitants. Ninety-eight percent of the inhabitants were Muslims and the remaining two percent were Christians. Fishing was the main occupation and the main source of income for half or slightly more than half of the village population. Fishing was carried out throughout the year, the lean months being August, October and December.

Other village occupations were farming and retailing. Most of the women in the villages were involved in income-generating occupations, such as fish processing and marketing, farming and retailing of food items and household goods.

The larger village was connected by all-weather roads, while the two smaller villages were connected by dirt roads. Regular public transportation was only available along the main road of the district, which connects the district capital, Bagamoyo, with the national capital, Dar-Es-Salaam. The most common transport from the villages to the main road was on foot or by bicycle. None of the villages had garbage disposal, sanitation or hygiene facilities.

All the villages had small village markets, including a few retail shops. There was an elementary school in each village, and the nearest secondary schools (normally not frequented by villagers) were 13 to 15 kilometers away, in the district capital. All villages had maternal, child health and family planning services, which were provided by nurses. One village also had a pharmacy. In all the villages, inhabitants made use of witch doctors and magicians to solve their health and marriage problems. The influence of these doctors on mental health is not to be underestimated. About 5-10 percent of women using contraceptives traditionally use herbs, or wear a belt with pieces of wood on it for protection against pregnancy.

The two agricultural villages studied in Tanzania were located further inland on the main district road, connecting the district capital to the national capital. These villages were larger, with populations of about 5 500 and 6 100, respectively. As in the fishing villages, the inhabitants were mainly Muslims with a few Christian households. The agricultural villages were less congested and clustered than the fishing villages, with more land around the houses.

The main economic activity was farming. The main crops included coconuts, cashew nuts, oranges, mangoes, pumpkins, rice, maize, cassava, pineapples and peas. The cultivation of cashew nuts, which used to be of primary economic importance, has greatly declined partly as a result of the

Government's forced resettlement policy. Other income-generating activities included retailing and charcoal manufacture. Women in the agricultural villages were actively involved in farming and retailing, as well as in fish processing and marketing.

As with the smaller and more remote fishing villages, there were only primary and no secondary schools. The situation regarding health facilities, postal services, sanitation and hygiene is also similar.

Most villages date back to the beginning of the twentieth century. In the 1970s, the villages underwent major political and economic changes that affected institutional and economic structures at the national and community level, as well as the livelihoods of households. This was the result of the Government policy forcing large numbers of farmers to leave their farms and move to designated nuclear villages, where they received one acre of land to till. Farming households in coastal regions were also affected by this because production of cashew nuts, the main cash crop, declined,

Status and management of fisheries resources

The majority of men and women in fishing communities agreed that over the last few years the total catch, the variety of fish caught and the average size of fish has seriously declined because of an increasing number of fishers and fishing boats. In the case of total catch and the variety of fish caught, almost 90 percent of the men and more than two thirds of the women recognized a decline of fisheries resources. Concerning the size of fish caught, 80 percent of the men and 57 percent of the women saw a decline they attributed to overfishing. Almost two thirds of the men and slightly less than half of the women recognized also that the quality of the seawater has seriously deteriorated owing to industrial waste, household waste, sewage and pollution from ships.

About half of the male and female respondents agreed that the Government has taken adequate steps for the conservation of fisheries resources, while the rest was undecided or disagreed. Regarding the conservation and protection of the coastal environment, about the same number of people thought adequate steps had been taken as those who thought they had not.

Occupational status, inter-generational occupational and geographic mobility

Seventy-nine percent of the men of reproductive age in the fishing villages studied had fishing or related activities, such as fish marketing, processing, boat building as a main occupation. Next in significance was agriculture (15 percent). Of minor importance was domestic work and small-scale retailing.

Of the households involved in fishing, about half owned one fishing boat. Only one of the boats had an inboard motor. The majority of the others were powered by sails or oars, while a minority shared ownership of boats with outboard motors. The most common types of boats were outrigger canoes, followed by dugout and planked canoes.

About 80 percent of the households in fishing villages owned fishing gears. The most common were gillnets (33 percent), handlines (25 percent), bottom long lines (14 percent), pelagic long lines (8 percent) and beach seines.

More than two thirds (69 percent) of the men in fishing villages had subsidiary occupations. The most significant was farming, which was carried out by three fourths of those who had a secondary occupation. Of minor importance were fish marketing/processing and retailing.

Compared to the occupations of their sons, fewer fathers, i.e. only 47 percent, had fishing or related activities as a main occupation. Many more fathers then sons, i.e. 29 percent, had farming as a main occupation, and another 20 percent were mainly employed in the service sector, retailing, cottage industries, handicrafts, etc. This finding indicates that an inter-generational occupational shift from agriculture and other rural employment into fishing has taken place.

Compared to fishing villages, employment was more homogenous in agricultural villages with 92 percent of all men of reproductive age finding their main occupation in agriculture. Other main occupations, of minor importance, however, were in the service sector, retailing and fishing. Secondary occupations, mainly retailing, small-scale businesses and handicraft, were less common in agricultural villages than in fishing villages and only 46 percent of the farmers were involved in them.

Concerning inter-generational occupational mobility in agricultural villages, only 78 percent of the older farmers (an average of 14 percent fewer than their sons) had farming as a main occupation, while the others were mainly employed in the service sector and in fishing. This shows that as in agricultural villages, an inter-generational shift into farming can be observed.

Inter-generational occupational mobility has gone hand in hand with geographical mobility, i.e. immigration. Only 73 percent of male fisherfolk and 67 percent of male farmers grew up in the villages where they presently live. The corresponding figures for women were 58 percent and 51 percent, respectively, as wives join their husbands' households after marriage.

An overwhelming majority in fishing (85 percent) and in agricultural villages (96 percent) were women involved in income generating and food production activities. Farming, domestic work and retailing/small-scale businesses were the most common in fishing villages. Women in agricultural villages were almost exclusively involved in farming, aside from a few, however, involved in retailing, fishing, the service sector or in domestic work.

Only a minority of the men in fishing (29 percent) and agricultural villages (24 percent) thought that their occupation was financially beneficial. Women saw their work as more financially beneficial than men (43 percent and 40 percent in fishing and agricultural villages, respectively, although the majority of the women were not satisfied with the financial benefits of their work.

Income, savings, debt

The average annual income per household in the fishing villages was Tanzanian Shillings (Ts) 258 320, significantly higher than the average annual household income in the agricultural villages (Ts185 298. In absolute terms, both incomes were very low and the majority of all heads of households in fishing, as well as in agricultural villages assessed the household income as barely sufficient.

Concerning sources of income, farming income was quite low. In the agricultural villages income from employment in service industries, retailing and even from processing and retailing of fish was higher than the income earned from farming. This was to a large extent carried out on a subsistence level and as a provider of food.

In terms of savings and debt, less than one fifth of the households in agricultural and fishing villages saved money and the amounts saved were very low. There were hardly any differences between agricultural and fishing villages. The rate of borrowing and the amounts borrowed were

even smaller than the rate of savings and the amounts saved. This is not surprising, as the main source of loans were relatives and friends whose income as shown above was hardly sufficient to support their own families.

Educational status

Educational standards were similarly low both in fishing villages and in agricultural villages. While about three fourths of the men and women of reproductive age had ever attended school, only about half of the respondents of reproductive age had actually completed primary education. The quality of primary education in this part of Tanzania is not considered very high. The number of villagers who completed secondary education is negligible[28]

Housing and infrastructure

Housing conditions were equally poor in fishing and in agricultural villages. Eighty-seven percent of the houses had mud walls and floors with thatched roofs of palm leaves or grass. Most of the houses had two or three rooms. More than 90 percent of the households got their water from public taps. Wood was the most common source of fuel.

Political participation

Only one of the fishing villages has a fishers cooperative society, another had a seaweed growers' association and a women's association, and the third had a cashew growers' association. Regarding mass media, there were no newspapers available in the villages. People listened to the radio. In the larger village, more than one tenth of the adults were members of political parties, while in the smaller villages, less than one tenth belonged to political parties. None of the fishing villages studied had a history of conflicts with neighbouring villages.

One of the agricultural villages has a cashew growers' association, which is, however, in a dormant state. The other village has a women's association. The membership of men in political parties is significantly greater than in the fishing villages and, in one of the villages, more than half of the men belong to a political party. As in the fishing villages, newspapers were neither available nor read in the agricultural villages, however people listened to the radio.

Both of the agricultural villages studied had a history of land disputes with neighbouring agricultural villages. These disputes were probably related to the resettlement policy of the Government in the seventies, which resulted in a higher concentration of people in this part of the district, and in unresolved conflicts between traditional land-use rights.

Senegal

General characteristics of villages

The five fishing and agricultural villages studied in Senegal were located in the Louga, Thiès and Saint Louis regions. The villages were spread over a distance of about 150 kilometers in the coastal belt between Dakar and the northern regional capital of St. Louis. The inhabitants of the villages belonged to different Islamic religious groups (Moride, Khadre, etc.) and to various ethnic groups such as the Wolof, Lebous and Maures. One of the fishing villages was large with about 6 000

[28] It is interesting to note that illiteracy among artisanal marine fisherfolk in Tanzania is much higher than illiteracy among artisanal inland fisherfolk on Lake Tanganyika. See FAO (1994).

inhabitants, three villages were of medium size with 2 000 to 2 500 inhabitants, and the fifth village is small with 600 inhabitants. The agricultural villages studied were smaller in size with populations ranging from 210 to 1 325 inhabitants.

Two of the fishing villages were close to an urban centre (at one and four kilometers, respectively), while the other three villages lay between 37 and 56 kilometers from the nearest urban centre. The agricultural villages were located within 10 to 68 kilometers from the nearest urban centre. About two thirds of the fishing villages and 60 percent of the agricultural villages were accessible by all-weather roads. All the villages studied could be reached by public transport.

Because the fishing villages studied were bigger than the agricultural villages and two of them were close to urban centres, they had better educational, health and communication facilities. While two of the agricultural villages did not have a primary school, all the fishing villages had primary schools, as well as literacy classes for adults. The two fishing villages close to urban centres had secondary and tertiary educational facilities within easy reach. These villages also had various types of health care facilities near by, while only one of the other three fishing villages and one of the agricultural villages studied had a primary health centre. Few villages had dispensaries or a health professional. Three of the fishing villages had post offices all them had bus transport while only few of the agricultural villages had these facilities.

Sanitary facilities and arrangements for garbage disposal were absent in all the villages studied. This had extremely negative consequences for the natural environment, i.e. the sea and the rivers along which the villages were located.

Status and management of fisheries resources

An overwhelming majority of both men and women in fishing communities agreed that over the last few years the total catch, the variety of fish caught and the average size of fish has seriously declined, owing to the increasing number of fishers and fishing boats. In the case of total catch and variety and size of fish caught, more than 93 percent of the men and more than 98 percent of the women recognized a drastic decline of fisheries resources that they attributed to overfishing. More than 82 percent of the men and 86 percent of the women also recognized that the quality of the seawater had seriously deteriorated, owing to industrial and household waste, sewage and pollution from ships.

While the majority of fishermen and women were in favour of strict regulations of fishing effort with the objective to rehabilitate and conserve fisheries resources, only a small minority felt that the Government had taken appropriate measures.

Occupational status, inter-generational occupational and geographic mobility

The main occupation of slightly more than half (53 percent) of all the fisherfolk of reproductive age in the fisherfolk households studied, was fishing or fish marketing and processing, Other occupations were farming, horticulture, animal husbandry (nine percent) and retailing (three percent). Twenty-two percent of the fisherfolk respondents were involved in unspecified and transitory income-generating activities.

In the agricultural villages, fewer household members were involved in income- or food-generating economic activities than in fisherfolk households. Fifty-eight percent of all farmer household members of reproductive age were involved in agriculture and horticulture. Other income-

generating activities were retailing (five percent), fishing and fish processing (five percent). Other unspecified economic activities accounted for another six percent of employment.

Concerning the employment of male household members of reproductive age, 71 percent were involved in fishing, fish processing and marketing, while 10 percent were involved in agriculture, five percent in retailing, and eight percent in unspecified income-generating activities. Comparing the occupations of the respondents with those of their fathers, it becomes obvious that an occupational shift from farming and other employment into fishing has taken place over the last generation. Only 57 percent of the fathers of male household members of reproductive age in the fishing villages studied were involved in fishing and fish processing, while 27 percent had farming as a main occupation, another 12 percent, factory employment, and another three percent, retailing and employment in the military.

In the agricultural villages studied, the opposite trend can be observed, i.e. an occupational shift out of farming over the last generation. Only 46 percent of the men of reproductive age in the agricultural villages studied were involved in agriculture and horticulture, as compared to 74 percent of their fathers. Only 17 percent of the fathers were involved in factory work four percent in other activities, such as fishing, the military and retailing. Almost one third of their sons were involved in unspecified, transitory income-generating activities, 15 percent in retailing, and four percent in fishing and fish processing.

As far as the outlook for the future is concerned, only a minority of both fisherfolk (18 percent) and farmers (four percent) wanted their sons to follow in their occupational footsteps. Agriculturists had a more negative outlook than fisherfolk.

Income, savings, debt

While in both type of villages, the largest groups of households assessed their financial situation as insufficient, fisherfolk households perceived their financial situation more favourably than agricultural households. Forty-eight percent of fisherfolk households saw their financial situation as insufficient, compared to 60 percent of farming households. Sixteen percent of the fisherfolk households, on the other hand, saw their financial situation as sufficient, compared to only four percent of the agricultural households.

The above perceptions reflect the differences in the average annual household income of Francs 13 337 038 in the fishing villages, compared to a much lesser amount (Francs 8 941 021) in the agricultural villages. Accordingly, the share of fisherfolk households that saved regularly is 27 percent higher than the corresponding share of agricultural households. The average annual amounts saved by fisherfolk households were also significantly higher than the savings in agricultural households. The picture is completed by the much higher rate of indebtedness of agricultural households (39 percent), compared to fisherfolk households (17 percent).

Educational status

In general, the rate of school attendance of people above six years of age in fishing and agricultural villages studied was 21 percent, which is low compared to the national average in Senegal, about 60 percent. The level of education was generally higher in the fishing villages studied than in the neighbouring agricultural villages. In fishing villages school attendance was found to be 25 percent, while it was only 17 percent in the fishing villages.

Comparing those who were attending or had finished school, the level of education seemed to be higher in agricultural than in fishing villages. In fishing villages, 89 percent were attending or had completed primary school, seven percent, secondary school and four percent, technical school or college. The corresponding figures for agricultural villages were 77 percent, 16 percent and seven percent.

Housing and infrastructure

The type and quality of housing and related infrastructure reflect socioeconomic status and have implications for health and welfare. In terms of access to electricity and adequate sanitary facilities, the conditions in the fishing villages studied seemed to be better than those in agricultural villages. Sixty-one percent of the houses in fishing villages had electricity, compared to only 32 percent in agricultural villages. One fourth of the houses in fishing villages were considered to have adequate toilets, compared to only two percent in agricultural villages. One fourth of the houses in both agricultural and fishing villages had access to safe drinking water.

Concerning the construction and size of fishers' and farmers' houses, there were no significant differences. Most houses were solidly built and more than three fourths of the houses had brick walls and cement roofs, while the floors were frequently made of clay.

Political participation

All the fishing villages studied had professional, social and economic organizations such as fishers', farmers' and foresters' associations, women's groups etc., while only three of the five agricultural villages had similar associations.

Membership in political parties was more common in fishing villages than in agricultural villages. In three of the five villages, more than half of the adults were members of a political party. In the other two villages membership was more than one third of the adult population. Because of the low literacy rate among adults, newspapers were either unavailable or not read in the villages, with one exception, and the radio was the most important mass media.

Conclusions

It has been shown in the sections above that contrary to what was commonly believed and published for many years, fisheries no longer seem to be a "last resort employment" for people in coastal areas, at least not in most of the countries included in the study. The number of coastal fishers has actually started to decline or stagnate in four of the six countries studied, namely the Philippines, Malaysia, Tanzania and Senegal. The number of fishers is still increasing, however, in India and Bangladesh, although to a much lesser extent than in previous decades.

In Malaysia where there was an overall decline in the number of coastal fishers, the decline is also reflected in an inter-generational occupational mobility out of fishing into other occupations in the service sector or into unemployment. In the Philippines and Tanzania where the number of coastal fishers has also started to decline, changes are more recent and the studies still show inter-generational occupational mobility into fishing from other sectors of the rural economy. This is also the case in two of the countries where the number of fishers is still increasing, namely Bangladesh and the Philippines.

In all the villages studied, fishing and farming still dominate, but other occupations have become more significant in some countries, such as the Philippines, India and Tanzania. They were less

significant in Malaysia and Bangladesh. Women were very actively involved in income and food-generating activities in fishing and agricultural villages in India, Tanzania, Senegal, and less actively involved in Bangladesh, Malaysia and the Philippines.

The studies show another interesting fact, contrary to the common belief that fisherfolk are the poorest group of the rural population in coastal areas. In five out of the six countries studied, and in spite of declining catches, the average annual household income of fisherfolk households is still significantly higher than households in neighbouring agricultural villages. This is supported by the information on savings and debt of households in fishing and in neighbouring agricultural villages. The savings rate and the amounts saved were generally higher in fishing villages than in agricultural villages, and households in agricultural villages were as indebted or more indebted than those in fishing villages. (The only exception to this is Malaysia; a reason for this might be that many fishers who had given up fishing because of resource constraints and Government regulations could not find other employment, as can be seen from the relatively high percentage of unemployed men of reproductive age in the Malaysian fishing villages, compared to the other countries, as well as the comparatively high income of farmers in Malaysia.)

Regarding educational levels of fisherfolk and agriculturists, these were equally high in the fishing and farming households studied in the Philippines, and equally low in the fishing and farming households studied in Tanzania. In Malaysia and Bangladesh, agriculturists had higher levels of education than fisherfolk, and in India and Senegal, fisherfolk had a higher level of education than agriculturists. Regarding housing standards, households of agriculturists were better off in the four Asian countries studied. In Senegal, fisherfolk were better off, and in Tanzania, housing conditions were equally poor in fishing and agricultural villages.

As to their perception of the status of fisheries resources and coastal environment, the majority of fisherfolk in four of the six countries studied, namely the Philippines, India, Bangladesh and Senegal acknowledged that they had seriously declined and deteriorated because of past increases in the number of fishers and fishing boats, and because of domestic and industrial sea pollution. Fisherfolk expected the Government to introduce strict regulations and measures for the rehabilitation and conservation of fisheries resources and the coastal environment, and noted that very little had been done so far. Only in Malaysia, did the majority of fisherfolk feel that the Government had taken appropriate measures and that the outlook was positive.

Membership in political parties, professional and social associations was high in four countries, namely India, the Philippines, Malaysia and Senegal, while it was low in Tanzania and Bangladesh for the reasons explained above which include cultural and religious barriers and social isolation.

Assessing changes in overall socioeconomic status over the last generation, fisherfolk in the Philippines, Malaysia and India generally saw improvements, while fisherfolk in Bangladesh, Tanzania and Senegal did not see improvements. These views obviously reflect significant changes in income, standards of living, infrastructure and general services in rural coastal areas in some of the countries where the studies were carried out.

5. SOCIODEMOGRAPHIC CHARACTERISTICS AND CHANGE IN COASTAL FISHING COMMUNITIES

By G. Groenewold

Introduction

This chapter attempts to better understand the patterns of demographic and occupational change in the populations of communities studied. Growth in the numbers of fisherfolk – or in the population of their communities – is determined by demographic components (fertility, mortality and migration) and by changes in rural livelihoods. The latter may be decisive, and there may be a variety of reasons for the increase in fisherfolk.

Civil wars and other forms of political instability, for instance, may cause people to migrate to coastal regions, to temporarily or permanently seek income from fisheries as during the civil war period in Mozambique. In areas where farmers had undergone a number of harvest failures, or where availability of and access to land had become scarce, or where financial returns of farming were decreasing, some or all members of farming households may turn to fisheries. In the 1970s, in Senegal, periods of drought destroyed groundnut farming. Large movements of immigration took place of people seeking new livelihoods in Dakar, abroad, or in settlements along the coast. Thus, households and entire communities previously labeled as farming households may have become fisherfolk and fishing communities, if income from fisheries proved to be the main source of sustenance (FAO, 1998).

Given the above, the objectives of this chapter are threefold. First, to determine whether fisherfolk in fishing communities generated socioeconomic and demographic statistics which differ from those of farming households in nearby agricultural communities. Comparisons between the two types of community will be made against the background of regional or country-level benchmark statistics. Second, to assess whether there exist common features or differences regarding demographic and social indicators across community types and countries. Third, to determine the role of demographic variables in the population dynamics of coastal fishing communities.

Differences between fishing and farming communities within countries

The communities and households surveyed are located in countries that differ greatly in their economic and sociocultural characteristics. Therefore, if in spite of great variations in context (and small sample sizes) the surveys reveal consistent differences between fishing and farming communities for specific demographic and socioeconomic variables, it must be concluded that those communities do differ significantly. This has potential implications for policy making.

Senegal

Tables 34 and 35 show that both types of village had a very young population. About 50 percent of the population was below the age of 14, reflecting a history of high fertility. Households often consisted of extended families, and more than half of the married women lived in polygamous marriage arrangements. Polygamy is more prevalent in farming villages. In Senegal, women in a polygamous marriage often live in multi-residential household settings, where the husband spends a certain number of days in turn with each of his wives, who live in separate housing units.

In fishing communities, relatively more women were reported to be head of households than in farming communities. This may well be due to frequent absences of husbands on fishing journeys.

Table 34 –Selected demographic and socioeconomic characteristics of households: Senegal, Tanzania and India

Characteristic	Senegal			Tanzania			India		
	Fish. com.	Farm. com.	DHS 96/97	Fish. com.	Farm. com.	DHS 91/92	Fish. com.	Farm. com.	DHS 92/93
Type of households in study area:									
Percent fisherfolk households	60	10		89	11		99	1	
Fisherfolk/farming households contacted	(231)	(218)		(123)	(102)		(101)	(99)	
Percent age distribution:									
• **Females**									
0-4	16	22	18	24	22	18	8	3	12
5-19	47	38	39	31	35	38	36	26	33
20-29	14	15	12	24	16	15	18	20	18
30-39	13	11	11	10	13	10	14	15	13
40-49	5	7	7	3	7	7	12	17	10
50 and above	5	7	13	8	7	15	12	19	14
	100	100	100	100	100	100	100	100	100
Median age	14	14		18	16		23	30	
(Female household members)	(990)	(1064)		(300)	(303)		(329)	(228)	
• **Males**									
0-4	15	21	20	27	25	19	8	8	14
5-19	45	44	44	28	35	42	37	25	34
20-29	12	10	10	16	11	12	18	30	17
30-39	13	8	7	13	11	9	13	11	13
40-49	9	5	6	5	6	6	12	10	9
50 and above	6	12	13	11	12	12	12	16	13
	100	100	100	100	100	100	100	100	100
Median age	14	12		17	15		21	25	
(Male household members)	(1108)	(764)		(224)	(272)		(343)	(257)	
Average household size	8.9	9.1	9.6	7.1	6.1	4.4	6.7	4.9	5.7
Percent female-headed households	8.5	3.7	10.5	7.8	20.6	17.0	18.8	17.2	9.1
Rating of financial situation of household by heads of households (%):									
More than sufficient	0	0		0	0		9	15	
Sufficient	14	4		5	16		45	50	
Barely sufficient	41	36		53	43		30	25	
Insufficient	45	60		42	41		16	10	
Percent of households which:									
Owns land	27	89		70	46		1	92	
Owns animals	38	41		40	46		3	60	
Owns/shares boats	49	0		75	...		40	...	

Note: ... = not reported.

Households in both types of community reflected marriage and fertility behaviour observed elsewhere in rural Senegal. Women married young, between 16 and 18, and followed the tradition of their mothers, according to cultural norms. By the end of her reproductive life, a fisherfolk woman had given birth to an average of seven children, one more than a woman in a farming household. Before the age of 25, women in both types of household have given birth to two children. More than three out of four men and women were illiterate or had no education at all. This was more so in farming communities.

Table 35 – Selected demographic characteristics of eligible household members: Senegal, Tanzania and India

Characteristic	Senegal			Tanzania			India		
	Fish. com.	Farm. com.	DHS 92/93	Fish. com.	Farm. com.	DHS 91/92	Fish. com.	Farm. com.	DHS 92/93
Number of respondents	742	629		177	146		233	163	
Average age of respondents:									
Male	33	35		40	43		0	43	
Female	29	29		31	37		35	37	
Percent illiterate *:									
Male	78	85	77	10	22	45	50	30	...
Female	79	86	86	24	35	57	65	69	50
Median age at first marriage:									
Married men (age group 20-60)	22	25	...	24	22	...	22	24	24
Married women (age group 20-49)	18	18	16	18	18	18	18	18	18
Perceived appropriate age at first marriage (median):									
Married men: For men	20	25		20	22		22	5	
For women	15	16		18	19		18	18	
Married women: For men	25	25		20	20		22	22	
For women	16	16		18	18		18	18	
Average number of children ever born:									
Married women 15-24 **	2.0	1.9	0.8	1.2	2.5	1.5	1.5	2.0	0.8
Married women 40-49	6.7	5.9	7.1	7.8	7.4	7.2	4.3	3.2	4.5
Married women 15-49	3.9	3.8	...	5.2	5.1	...	3.3	2.7	...
Perceived ideal number of children (average):									
Married men	1.2	0.6		7.5	7.3	...	0.9	2.5	...
Married women	7.6	8.2		6.9	5.9	6.4	2.4	2.3	2.5
Son preference – ideal sex ratio:									
Married men	2.4	2.0		1.4	1.4		1.5	1.3	
Married women	1.9	1.5		1.2	1.3		1.2	1.2	
Use of modern contraceptive methods (married women 15-49):									
% ever-users	28.6	7.0	10.6	44.2	41.2	15.8	71.1	68.3	37.1
% current user	18.9	2.9	2.3	14.1	16.1	6.6	64.4	60.4	33.2
Desirability of last birth (married women, 15-49):									
Percentage who wanted child then	60	73		nr	nr		66	80	
Percentage stating 'Better if born later'	25	18					11	13	
Percentage that did not want child	15	9					23	7	
Percentage of married women (15-49) with more live births than the ideal number :									
Excess is 1 child	7	2		13	5		26	21	
Excess is 2 children	–	2			11		19	8	
Excess is 3 children or more	1	3		15			13	5	
Percentage of married women (15-49) in a polygamous union:	53	61	45.2	6	6	22	2	0	...

Notes: ... = not reported/not available/not asked.
nr = high non-response (92 percent).
* = DHS reports refer to "no education" only, which is not necessarily the same as "illiterate"
** = in practically all countries averages for this age group were based on less than ten responses

Table 35 shows that fertility aspirations were very high for men in both types of household, particularly for the men in fisherfolk households. As most of the married men had at least two wives and desired a relatively high number of children (seven to eight), the high number of children reported by men is not surprising. In both types of household, men as well as women expressed a very strong preference for sons especially in fishing communities. Artisanal fishing is organized preferably around kin-based work groups consisting of fathers, sons and close male relatives. Moreover, sons are expected to provide financial support for parents in their old age. The strong son preference is associated with the observed high fertility in both types of community. As we see below, the communities studied in Tanzania and Malaysia (also predominantly Muslim) exhibit lower fertility levels, but the preference for sons is also lower.

Altogether, contraceptive use was not very common, especially in farming communities. However, the younger generation of women expressed the desire to break away from the marriage and reproductive traditions of their mothers. The older women were aware of the negative health effects of having many pregnancies, especially at a very young age. Regarding the use of contraceptives, the older women in focus group discussions mentioned that they had grown up in the tradition that children were the gift of God for which one must be grateful, and birth control methods were only to be used in case of health risks. It was too late for them to plan the number of births. In other areas of their lives, however, the older women attempted to break away from traditions. They tried to negotiate with their husbands for more autonomy to become economically active. Some aspired to become boat owners and to rent their boats (pirogues) to the men.

Most of the younger women in the focus groups mentioned that they had "modern" aspirations, including education, marriage in their mid-twenties and jobs outside the home and village. These aspirations were perceived as incompatible with a large number of children. In effect, female groups addressing family affairs, employment, health and education for women are successful in many rural communities.

In both types of community, the younger women perceived that they were undergoing rapid transition. The younger men also wanted to break away from many traditional marriage and reproduction norms, but they were more hesitant than the women. The younger males, confronted in recent years with an increase in unemployment, shied away from the financial responsibility of raising the same number of children as their parents. Moreover, the younger generation projected their educational and employment aspirations on their future children, and concluded that raising too many children is expensive. The focus group discussions did not provide information on the higher contraceptive ever-use and current use rates in fisherfolk households, compared to farming households (see table 35).

Relatively few women (about eight percent) in both types of household reported having more children than the ideal number. However, a much larger percentage of the women mentioned that the timing of the last child born was not as desired, or was unwanted, especially among fisherfolk women. This situation was observed in 40 percent of the fisherfolk women and in 27 percent of the women in farming households. Apparently, many of the interviewed married women did not effectively use a family planning method to space or limit pregnancies. Given the aforementioned developments in emancipation in these rural communities, there seems to be a need for the extension of better family planning information and education.

In conclusion, although Senegalese fisherfolk households seemed to experience somewhat better living conditions in terms of production assets and consumption items than farming households, the financial situation was perceived to be barely sufficient, or insufficient, in both types of household. The focus group discussions reported changing reproductive intentions and behaviour, especially in

the younger generation of women and men in both types of village, but these changes were not (yet) observed in the statistics generated by the household survey. Possibly, this reflects a discrepancy between attitudes, intentions and behaviour. Overall, the household survey suggests that there were some common features and differences between fishing and farming households in the two types of community. In both types of household, most members are illiterate or have no formal education. Female respondents have married young and the appropriate age for marriage of women, as perceived by men and women in the communities, is still young - about 16 years. Among older generations fertility levels were somewhat higher in fisherfolk than in farming households. High fertility in both types of community is fuelled by a strong son preference.

Overall, contraceptive prevalence is low in both types of community, reflecting the high desired number of children in both types of household. Prevalence rates of modern contraceptives among fisherfolk women are much higher than among women in farming households, which is consistent with the reported lower desired number of children by fisherfolk women. Despite the higher use of modern contraceptives among fisherfolk women in fishing villages, these women more often report unwanted or mistimed births than women in farming villages. Therefore it seems that the reported high prevalence is counterbalanced by low use effectiveness.

Tanzania [29]

The household survey data (Table 34) show that the populations covered in both types of community were young. Overall, fifty percent of the population in fishing communities was below the age of 18, and in farming communities below age 16. Except for the youngest age group, which is relatively large, the age distribution characteristics of the two types of community were not much different from those of rural Tanzania. Households in fishing communities usually consisted of about seven persons and were somewhat larger than those in farming communities (six persons). Although one in five households in farming communities were headed by a woman, which is close to what is observed in rural Tanzania in general, in fishing communities this was far less, i.e. one in fourteen. More than 80 percent of the households evaluated the financial situation of the household as barely sufficient or insufficient, somewhat less so in farming than in fishing communities. In fishing communities there were more households owning land than in farming communities, but the plots were smaller in fishing communities than in farming communities. Electricity was practically absent in all households, but three out of four households in fishing communities had a (working) battery-powered radio, which is far more than observed in rural Tanzania. For fisherfolk, this was an important asset because of the broadcasts of weather forecasts.

Table 35 shows that the household members interviewed were predominantly older women. Female respondents in fishing communities were, on average, 31 years old, and those in farming communities were on average 37 years old. Key informants reported that adult illiteracy was on the rise, as literacy classes only existed in name. Although overall illiteracy levels in both types of community were much lower than in the rest of rural Tanzania, levels among women were higher than among men, and higher in farming households than in fishing communities. The median age of 18 at first marriage for women is the same in both types of community. The perceived appropriate age for marriage indicates that postponement of marriage to a later age was not really considered desirable. Reported lifetime fertility levels were high in both types of community for the older (seven children) and younger age groups of women, except for women in the 15-24 age group in fishing communities (one child). The perceived ideal number of children and son preference among

[29] In Tanzania, it was not possible to identify 'genuine fishing communities' and 'genuine farming communities'. According to the focus group discussion reports and the survey data analysis, most of the fisherfolk in the selected households combined fishing with part-time farming and animal husbandry.

men was higher than among women, and somewhat higher in fishing communities than in farming communities.

Focus group discussions on fertility issues disclosed that the older generation favoured a large number of children, whereas the younger generation wanted fewer because of the perceived cost of raising children. Moreover, the younger men complained that economic hardship in the area and low income earned in both fishing and farming made it difficult to save money for the bridewealth to be paid to the bride's parents. This resulted in the postponement of marriages. As marriage involves patrilocal residence, daughters are not in a position to contribute anything to the parents' social security after marriage. This made it attractive for parents to ensure that daughters married as young as possible.

Polygamous marriages were rare in both types of community, and only six percent of the married women reported living in such a marriage arrangement, far fewer than in other rural areas in Tanzania. Despite the availability of modern contraceptives in clinics in the villages, the use of modern contraceptives was low in both types of community, but somewhat higher than observed in rural Tanzania in general. This could be because of modern life influences and the proximity of Dar-Es-Salaam. Many villagers frequently traveled to the capital city. Only about one third of the women in both types of community who stated that they ever used a modern contraceptive method confirmed that they were current users. Overall, but particularly in male focus groups, the discussions revealed that family planning was an issue to be talked about and decided on by the individuals and their partner within the confines of the family, and outside interference was not appreciated.

Moreover, family planning practices met with religious objections and modern methods were believed to be harmful. Against this background, the fact that practically all the married women reported that their last child born was "wanted then" or "wanted, but later" is consistent with earlier findings. Only seven percent of the women in fishing communities reported that they had numbers of (surviving) children above the ideal number, whereas the proportion was somewhat higher among women in farming communities (13 percent).

In conclusion, regarding the variables studied, fishing and farming communities in Tanzania seemed very similar regarding main household characteristics, except that in farming communities more women were heads of households and there was less illiteracy than in fishing communities. There were only slight differences in fertility indicators between farming and fisherfolk households, except that farming women reported a lower ideal number of children than fisherfolk women.

India

Fisherfolk, especially the younger generation, expressed a desire for small families (2 children). The extended family system is disappearing, and nuclear family structures are now becoming more common, except in boat-owning, property-managing families. However, families had larger numbers of children if the early births were not sons. It appears that birth spacing was not adopted by fisherfolk. Rather, they resorted to permanent methods (i.e. tubal ligation), after the desired number of children was born. The older generation of women reported that they had occasionally resorted to abortion if traditional methods of family planning (withdrawal and periodic abstinence) failed. The family size norms and family planning strategies of today's farmers and fishers appear to be similar. Discussion group members mentioned that their desired fertility is linked to the perceived prosperity offered by their livelihood.

The results of focus group discussions put in context the household survey results, but some additional insights were provided by the household survey data, especially with respect to the degree of success of families in planning their fertility. Table 35 shows that the fisherfolk population was younger than the population in farming communities: 50 percent of the fisherfolk population was below age 22, against 28 years in farming communities. Fisherfolk households typically consisted of seven persons, almost two persons more than in farming households. Possibly this is due to a higher prevalence of extended family structures in fishing communities as compared to farming communities. This household size is also higher than Maharashtra State average. In both types of community, almost one in five households reported women as head of household, which is about twice the average observed for the State as a whole.

The interviewed respondents were mostly older women. This is of particular importance when interpreting answers on the family planning questions in the household survey. In both types of community, two out of three female respondents could not read or write, and illiteracy in both types of community was higher than the levels observed in Maharashtra State as a whole. The opinions of male and female respondents on the appropriate marriage age for women were consistent with the results of the focus group discussion. This was perceived to be 18 years by half of the respondents. According to focus group members, traditionally, daughters were married very young, at 11 years. However, this was no longer practiced in fishing and farming communities.

The youngest age group of women in fishing communities reported a lower average fertility than in farming communities, but the difference is not statistically significant. Completed fertility levels of the older generation of women was higher in fishing than in farming communities, and the difference is statistically significant. Desired numbers of children were somewhat higher in fishing than in farming communities, and in both types of community men desired more children than their wives, most notably in fishing communities. Men in fishing communities had a stronger preference for sons than their wives and than the men and women in farming communities. Contrary to daughters, sons can be taken to sea and help with fishing. Sons also can contribute to household income by working in non-fishery activities.

Percentages of ever-use and current use of modern contraceptives were high in both types of community, especially when these percentages were compared with that of Maharashtra State. However, this is due for a large part to the fact that the respondents in the survey were older women (on average 37 years old) and that many of them had been exposed to sterilization promotion campaigns. Over two thirds of the respondents in fishing communities reported to be ever-users, and slightly fewer reported to be current users. Most ever-users had opted for sterilization. However, current use rates of non-permanent methods such as the pill, IUD and condom was still low in both types of community. About 24 percent of the respondents in fishing communities reported that the last birth was unwanted, against seven percent in farming communities. Moreover, table 36 reveals that a very large proportion of respondents had more surviving children than their stated ideal number. This may be partly explained by the success of population information, education, communication (IEC) and sterilization campaigns promoting two as the ideal number of children (a son and a daughter). As was stated before, most of the respondents were older women, and many of them opted for tubal ligation only *after* they became aware that they had more children than they actually wanted.

There is no indication that the younger generation of fisherfolk women had a higher fertility than farming women. Although the desired number of children, and the preference for sons was somewhat higher in fishing than in farming communities, these differences were statistically insignificant. What stands out clearly is that female respondents in fishing communities were far less successful in planning their desired fertility.

Bangladesh [30]

The household survey data in table 36 shows that compared to the general population the populations in both types of community surveyed are very young. In fishing communities, about half of the population was 15 years old or younger; in farming communities the population was only slightly older – about half of the population was 17 or younger. This is indicative of past high fertility levels. The average household consisted of seven persons, higher than the national average of five persons. Households headed by females were absent in the predominantly Hindu fisherfolk communities, and in the predominantly Muslim farming communities. Fishing households mentioned that their financial situation was barely sufficient or insufficient more frequently (85 percent) than farming households (79 percent). This is confirmed by the social mapping exercise during participatory rural appraisal (PRA) research in one fishing and one farming community. About 75 percent of the village households were classified as poor, that is, earning less than Taka 5 000 (about US$12) per month. Almost 60 percent of the households in both types of community owned land, but farming households more frequently owned animals. In fishing communities, one in four households owned a radio, which is less than in farming communities.

Table 37 shows that illiteracy levels in both types of rural community were much higher than for the regional population (i.e. Chittagong Division) as a whole. There was a greater incidence of illiteracy among fisherfolk, especially fisherfolk women, than among other rural dwellers. Traditionally women married young in both types of community, especially in fishing communities where the groom paid bridewealth to the bride's parents. Today, the bride's family pays a dowry to the groom and his parents, as in the rest of Bangladesh. This implies a heavy financial burden for parents who have more daughters than sons. In Bangladesh, there is the proverb: "Raising a daughter is like tilling the land of one's neighbour, without reaping the benefits". Conversely, having sons is important for parents for financial security in their old age. This explains the preference for sons in both types of community. The ideal sex ratio of children (males for one female) is perceived to be about 1.7. The dowry system and economic dependence of parents on sons will maintain relatively high fertility levels. Most female respondents married around age 16, but they, as well as their husbands, indicated that the appropriate age of marriage for a women should now be at least two years older, at about 18 years.

Lifetime fertility of the older women was 7.8 children in fishing communities and 7.6 children in farming communities. The younger married women still had high fertility, particularly in fishing communities, as married women will have about two children by the age of 25. The fertility level of the younger generation was found to be somewhat higher in fishing than in farming communities. Ever-use and current use of modern contraceptives in both types of community were somewhat lower than observed in the region. Although ever-use rates were somewhat higher in farming than in fishing communities, method discontinuation was higher in farming communities, resulting in lower current use rates. In the surveyed communities, there is a clear unmet need for family planning. In fishing communities, one in three married women mentioned that her last birth was not wanted, This was mentioned even more often in farming communities, where one in two married women made the same statement. Therefore, it is not surprising to find that 41 and 64 percent of the married female respondents had more children than their ideal number. Within this context, it is interesting to note that the ideal number of children reported by men is about the same as reported by their

[30] In this predominantly Muslim country, coastal fisheries is the domain of low-caste Hindus, a culturally distinct and economically disadvantaged group. In effect, all the farming community households surveyed were Muslim and all the fishing community households were Hindu. In these conditions the religious factor probably interferes heavily with economic factors in explaining differences in attitudes and behaviour.

wives. Perhaps the female respondents reported a desired family size in line with the opinion of their husbands due to the subordinate position of women in the household and in the community in general.

Table 36 – Selected demographic and socioeconomic characteristics of households: Bangladesh, Malaysia and Philippines

Characteristic	Bangladesh			Malaysia			Philippines		
	Fish. com.	Farm. com.	DHS 96/97	Fish. com.	Farm. com.	Census [a]	Fish. com.	Farm. com.	DHS 1993
Type of households in study area:									
% fisherfolk households	96	2		97	10		100	1	
Fisherfolk/farming households contacted	(100)	(100)		(100)	(101)		(100)	(99)	
Age distribution (%):									
• **Females**									
0-4	19	13	13	10	7	13	13	11	15
5-19	42	45	40	38	35	36	42	34	36
20-29	16	16	17	19	21	16	12	13	14
30-39	13	11	11	14	14	13	10	11	12
40-49	4	8	7	14	16	9	14	9	8
50 and above	6	7	12	5	7	13	10	23	14
Median age	14	17	19	22	22	22	17	22	...
(Female household members)	(311)	(299)		(385)	(337)		(252)	(244)	
• **Males**									
0-4	15	14	13	8	8	14	13	9	15
5-19	45	43	39	36	33	36	40	38	40
20-29	11	15	14	21	20	16	12	13	14
30-39	12	8	12	10	12	13	11	8	12
40-49	9	11	9	12	14	9	12	9	8
50 and above	8	9	13	13	14	12	12	24	12
Median age	15	17	19	20	22	22	18	22	...
(Male household members)	(338)	(367)		(392)	(381)		(300)	(278)	
Average household size:	7.3	7.2	5.3	8.5	8.0	4.8	5.5	5.2	5.3
Percent female-headed households:	0	0	9.0	6.8	11.6	...	6.0	5.0	12.2
Rating of financial situation of household by heads of households (% of households):									
More than sufficient	4	1		4	0		1	2	
Sufficient	21	21		78	83		53	33	
Barely sufficient	40	52		5	4		37	50	
Insufficient	35	26		13	13		9	15	
Percent of households who:									
Owns land	59	54		4	39		18	99	
Owns animals	58	89		19	60		78	98	
Owns/shares boats	46	0		44	33		50	1	

Notes: ... = not reported/not applicable/not asked.
a = 1991, rural areas only.

Table 37 – Selected demographic characteristics of eligible household members: Bangladesh, Malaysia and Philippines

Characteristic	Bangladesh			Malaysia			Philippines		
	Fish. com.	Farm. com.	DHS 96/97	Fish. com.	Farm. com.	DHS 96/97	Fish. com.	Farm. com.	DHS 92/93
Average age of respondents:									
Male	38	42		36	36		36	38	
Female	29	31		30	32		32	30	
(Total respondents)	(213)	(209)		(327)	(348)		(232)	(206)	
Percent illiterate:									
Male	68	62	35[4, 3]	3	6	... [2]	6.3 [1]	1.5 [1]	6.0
Female	74	66	51[4, 3]	3	6				5.1
Median age at first marriage:									
Married men, 20-60	23	25	...	24	24	26 [5]	25	25	...
Married women, 20-49	16	15	14	19	19		22	23	22
(Total respondents)	(195)	(177)		(188)	(181)		(127)	(116)	
Appropriate age at first marriage (median):									
Married men: For men	25	27		25	25		25	25	
For women	18	18		20	20		25	25	
Married women: For men	28	30		25	25		28	30	
For women	18	20		20	22		25	25	
Average number of children ever born:	2.2	1.7	1.4	1.1	1.0		1.5	1.1	...
Married women 15-24 **	7.8	7.6	6.2	5.0	4.4		5.1	3.9	3.8
Married women 40-49 **	4.3	4.9		3.9	3.6		4.4	3.9	
Married women 15-49									
Perceived ideal number of children (average):								4.4	
Married men	3.8	3.8	2.4	6.6	5.8		4.7	3.7	...
Married women	3.6	4.0	2.5	5.5	5.1		4.0		3.2
Sson preference – ideal sex ratio:								1.3	
Married men	1.7	1.6		1.1	1.1		1.3	1.2	
Married women	1.7	1.6		1.1	1.0		1.2		
Use of any modern contraceptive method: (married women, 15-49)									
% ever-users	47.9	54.4	66.0	69.7	46.5		44.8	19.0	44.6
% current users	28.7	27.8	30.8	26.2	13.2		27.6	11.2	16.7
Desirability of last birth by married women (15-49)									
Percentage who wanted then	48	30		90	82		67	68	
Percentage stating 'Better if born later'	15	22		3	6		16	16	
Percentage that did not want child	37	48		7	12		17	16	
Percentage of married women (15-49) with more live births than the ideal number:									
Excess is 1 child	8	12		3	8		19	12	
Excess is 2 children	7	16		2	4		5	7	
Excess is 3 children or more	26	26		2	1		15	12	
Percentage of married women (15-49) in a polygamous union:	7	6		6	11		2	2	

Notes: ... = not reported/not available/not asked.

1 = However, 39 percent of fisherfolk women report to be able to read "with difficulty"; in farming communities the percentage is 30.

2 = In practically all countries averages for this age group were based on less than ten responses.

3 = Chittagong Division.

4 = Instead of illiteracy rates, percent with no education was reported.

5 = Both sexes.

In conclusion, Bangladeshi fisherfolk were more disadvantaged in terms of living conditions and social welfare, than farming households. Part of this may be attributed to the fact that they experienced discrimination due to their low social status as Sudra caste Hindus in a predominantly Muslim environment. Illiteracy was particularly high among women in fishing communities. Fisherfolk women had somewhat higher fertility then farming women. Roughly half of the women in both types of community had ever used a modern contraceptive method, but only one in four was a current user, so discontinuation rates were high. The survey data show that a very large proportion of women did not successfully control their wanted fertility and this problem is perceived to be more acute in farming communities than in fishing communities.

Malaysia

Fisherfolk households were somewhat larger (8.5 persons) than farming households (8.0 persons), probably due to the higher prevalence of joint families in fisherfolk households. As table 36 shows, women less frequently headed a fisherfolk household (6.8 per cent) than a farming one (11.6 per cent).

Table 37 shows that few indicators exhibited differences between the respondents from the two types of household. As mentioned before, educational attainment in the villages was fairly high. Therefore, illiteracy was only observed in a small segment of the population. Female respondents, who were on average aged 31, had married fairly young (at 19) in both types of community. Respondents in fishing communities believed that the appropriate age of marriage for women should be 20 years, about two years less than the age perceived by married women in farming communities. Focus group members mentioned that men should marry much later than women, so they would be economically and psychologically better equipped to support a family. In the past, judging from the lifetime fertility experiences of older respondents, fertility must have been higher in fishing communities than in farming communities.[31] Overall, respondents in fisherfolk households desired a higher number of children compared to those in farming households, particularly among married male respondents. This was also confirmed in the accounts from focus group discussions. Fisherfolk wanted more children, especially sons, to help take over fishing activities, to ensure financial support in old age and to carry on the lineage.

As can be seen in table 37, more than two thirds of the married women in fishing communities had ever used modern and effective contraceptives; this is almost 25 percent higher than the women in farming communities. Despite the high rates of discontinuation in both types of community, the current use rates of married women in fisherfolk households were still twice as high than in farming households. Discontinuation of modern contraceptives is partly explained by a switch to traditional methods, such as rhythm, periodic abstinence and withdrawal. Men in both types of community mentioned a preference for such natural family planning methods, whereas women preferred modern methods, particularly the pill. Despite the high discontinuation rates and the low current use rates of modern contraceptives, the majority of the women, particularly fisherfolk women, seemed to have control over their wanted fertility. Relatively few women mentioned that they did not want their last child born or that the last birth should have come later. Also, in both types of community, and particularly in fisherfolk households, couples succeeded in having the actual number of children they desired. However, a rationalization of unwanted births by respondents may have taken place. Focus group discussions indicated that having more children than initially desired was not considered problematic, as it encouraged parents to work harder and seek more sources of income to meet the cost of raising them. Having a large number of children was financially attractive once the children were grown. It meant more income for the household and provided old age security for the parents.

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[31] A difference also seems to exist between the younger generations of women of the two types of community, but the difference is not statistically significant.

About one in twelve marriages were polygamous. These unions appeared somewhat more frequently in farming than in fishing communities. Women accepted such marriages, provided the husband could afford it and was fair to his wives regarding sleeping arrangements. Some men in focus groups had a negative view and mentioned that men involved in polygamous marriages may be untrustworthy and that these marriages were not free from fights. There did not seem to be any significant differences between fishers and farmers regarding opinions on polygamous marriages.

In conclusion, although in the past the number of children born was higher in fishing than in farming communities, this difference was not (yet) observed in the fertility of the younger generation of women. Overall, however, men in fishing communities reported higher numbers of desired children and preference for sons than those in farming households. This could be related to the fact that fisheries more than farming are perceived as labour intensive, but it might also reflect higher perceived risks of infant/childhood mortality among fisherfolk. Overall, it seemed that fisherfolk women had slightly better control over their fertility than women in farming households.

The Philippines

Table 37 shows that respondents considered the appropriate age of marriage for women to be around 25. Focus group discussions resulted in lower estimates, but, in general, especially in the younger generation, there was no strongly preferred age of marriage. The main criterion was that the person, male or female was "ready" for the role of spouse, father or mother. Past fertility levels were higher in fishing than in farming communities, and this is partly due to the higher desired number of children among respondents in their mid-thirties from fisherfolk households. It was recognized across generations that the cost of children had increased, and that the ideal number of children had decreased. Focus group members mentioned that because of the high cost of raising them, it is better to have fewer children. On the other hand, it is deemed that in the long run families with a larger number of children will be better off economically. In both types of household men wanted more children than women, mainly for the continuation of the family name and the expectation of adding income-earning labourers to the household.

Focus group discussions revealed that in both types of community, modern family planning methods (pill, IUD, condom) were primarily used by women below 30. Older women preferred traditional methods (withdrawal, abstinence). In addition, some methods (tubal ligation, IUD) were said to be avoided because women – and even more men – believed that these methods might weaken a woman and lessen her work capacity. Household survey data revealed that ever-use and current-use rates of modern family planning methods in fishing communities were more than twice as high as in agricultural communities. However, fisherfolk women reported to have more children than desired to a greater extent (40 per cent) than women in farming households (31 per cent). When asked whether the last child born was wanted, there appeared to be no difference between the women from the two types of household: two out of three married women mentioned that the last birth was actually wanted at that time. A possible explanation for this may be that contraceptive use-effectiveness among fisherfolk women was lower than among farming women.[32]

In conclusion, the traditional livelihoods in the Philippine fishing and agricultural communities do not in themselves provide sustainable and sufficient income sources to support adequate living conditions for the inhabitants. Although fisherfolk were still better off than farming households, the perceived prospects were grim. In both types of community, the younger generation was seeking alternative and/or secondary livelihoods, and some people preferred to migrate out of the

[32] Alternatively, the degree of rationalization of unwanted pregnancies is higher among fisherfolk women, perhaps as a consequence of low use-effectiveness.

communities to urban areas. The conditions favouring high fertility in the past have changed. Younger people favoured marriage at a later age, wanted fewer children, and used modern contraceptives more often than the older people, particularly in fishing communities. However, fisherfolk women had more children than the number desired by farming women, which may indicate that use-effectiveness of modern contraceptives was lower among fisherfolk.

Fertility and childhood mortality: a comparative perspective

The populations surveyed are located in countries that differ greatly in economic and sociocultural terms Therefore, if, in spite of small sample sizes and great variations in context, the survey data revealed consistent differences in specific socioeconomic and demographic variables, it must be concluded that these types of community differ economically and demographically.

The data from Tanzania and Bangladesh posed conceptual and analytical problems In Tanzania, it was not possible to identify "genuine fishing communities" and "genuine farming communities". According to the focus group reports and the survey data analysis, most of the fisherfolk in the selected households combined farming with part-time fisheries and animal husbandry. Therefore, the hypothesized effects of livelihood characteristics on reproductive perceptions and behaviour are very hard to disentangle. As for Bangladesh, a predominantly Muslim country, coastal fisheries are the domain of lower-caste Hindus, who are a culturally distinct and economically disadvantaged sub-group. The research data revealed that all the farming community households were Muslim, and all the fishing community households were Hindu. If the lower-caste Hindus had different fertility aspirations because of religious norms and values than the Muslim families, the impact of livelihood on fertility is difficult to assess. This is especially true if there is little or no variation in the religious denomination of households in the two community types. Deceptive associations between livelihood and fertility variables in the two types of community will result.[33] These limitations should be borne in mind in perusing the analyses below in respect of these two countries.

Despite the important role of fisherfolk women in the processing and marketing of fish, fish capture at sea is exclusively done by men. Not surprisingly, focus group discussions in villages and the household survey data (see tables 35 and 37) almost invariably showed that fisherfolk, both women and men, had a strong son preference, particularly in Senegal. Tanzanian households in fishing communities were similar to farming households, in son preference as well. In fishing communities many fisherfolk households depend for their sustenance on a mixture of farming, animal husbandry and operation of fishing boats.

In the past, the association of son preference with higher fertility levels has been the subject of research. However, the findings are not conclusive (Chowdhury & Bairagi, 1990; McClelland, 1979; Repetto, 1972; Mason & Taj, 1987). Moreover, there is controversy about whether men or women show a greater demand for children, particularly for male children, and there are conflicting theories regarding men's and women's reproductive goals (Cain, Khanam & Nahar, 1979; Caldwell, 1982). The reasons for son preference are most frequently the low status of women (Cain, 1984), patriarchal structures (Cain, Khanam & Nahar, 1979), differences between fathers and mothers regarding claims to the major share of children's love, loyalty and labour (Caldwell, 1982) and prevention of the financial risk of divorce, widowhood and old age dependency (Cain, Khanam & Nahar, 1979). However, research and debate rarely indicate the effect of the nature of the livelihood on gender preference of children. Although in most rural households a clear division of labour exists between

[33] A deceptive or spurious association occurs in this case because fertility (the dependent variable) is affected not so much by the hypothesized independent variable (N1=type of livelihood, i.e. fishing or farming) as by another independent variable (N2=religion) that is strongly associated with N1.

genders, few farming activities exclude involvement of women to the extent that women are excluded from capture fisheries at sea. This may explain why, on average, preference for sons among coastal marine fisherfolk is somewhat higher than in farming households.

Assessment of focus group discussions indicates that son preference is more pronounced among older people (40-49), particularly among men. Focus groups also mentioned other reasons for son preference: sons ensure continuation of the family and lineage name, and sons are important for the financial support of elderly parents, particularly if widowed. More than in farming households, fisherfolk try to achieve a desired number of sons. However, they are faced with the biological fact that the probability of having a son is about equal to having a daughter. This may explain why, across countries, fisherfolk births are somewhat more numerous, on average, than farming births. The differences are most pronounced in comparing the lifetime fertility experience of the older women in the two communities; fertility differentials are less pronounced in the younger women (15-24).

In all the communities, the younger participants in the focus group discussions mentioned desiring a smaller number of children than their parents. Moreover, most of them preferred other types of work to fishing and farming, a view supported by parents in countries where fishing is no longer perceived to be a profitable undertaking. The traditional gender division of labour in fisheries may change by the adoption of new fishing methods and new forms of organization. As a result, livelihood-related fertility differentials and child gender preferences may decrease.

Fertility and child mortality differences between fishing and farming households are addressed in Table 38. Since the age distributions of female and male respondents differed by type of community (see Tables 35 and 37), a direct comparison of numbers of children ever born (CEB) and children surviving (CS) would be biased by the age factor – the "older" community would tend to have had more children, regardless of its economic set-up. In order to compare households in the two types of community, therefore, it was necessary to standardize the average values of CEB and CS by using as covariate the age distribution of all married female respondents. The results indicate a consistent pattern of higher lifetime fertility levels in fishing communities. In all countries except Bangladesh, fisherfolk families had more births than farming families.

Table 38 – Standardized average numbers of children ever born and children surviving and average percentage of deceased children among currently married women (aged 15-49) in fisherfolk and farming households

Characteristic	Senegal		Tanzania		India		Bangladesh		Malaysia		Philippines	
	Fish.	Farm	Fish.	Farm	Fish.	Farm	Fish.	Farm	Fish.	Farm	Fish.	Farm
Own children ever born alive (CEB)	3.9	3.8	3.8	3.6	3.3*	2.6*	4.5	4.7	2.7	2.3	4.3	3.9
Own children surviving (CS)	3.7	3.6	3.2	3.2	3.1*	2.5*	3.5	3.7	2.5	2.2	4.0	3.7
Percent deceased children	5.1	5.3	15.8	11.1	6.1	3.8	22.2	21.3	7.4	4.3	7.0	5.1
Number of women	(259)	(286)	(49)	(47)	(104)	(63)	(94)	(90)	(92)	(87)	(57)	(42)

* The difference between results for fishing and farming households is significant at the 5 percent level.

In addition to observed fertility levels, it is interesting to note current fertility perceptions in the two types of community. As can be seen in tables 35 and 37, in all countries except Bangladesh, fisherfolk, and particularly fishermen, consistently reported higher ideal numbers of children than farming communities. The ideal number of children affects, among others, whether and how

contraceptive methods are used. However, the relationship between livelihood characteristics and contraceptive use is more complex because of the existence of various intervening and underlying factors, such as education and income levels, livelihood related demands for (more) children, infant and childhood mortality. Contrary to what one may expect, across countries observed higher fertility levels in fishing communities were associated with higher ever- and current use of modern contraceptives. A tentative explanation for this anomaly could be that use-effectiveness is lower and rates of discontinuation higher in fishing communities, but there is need for further research. If true, this would call for new or improved reproductive health services in fishing communities.

Overall, ever- and current use of contraception was low. The high illiteracy observed in the communities in four of the six countries could be one significant explanatory factor (Johnson-Acsadi and Weinberger, 1980; Phillips, 1980). Generally speaking, contraceptive use (and effectiveness) rates will be low when the number of surviving children is less than the stated ideal number. This was found in three of the six countries: Senegal, Tanzania and Malaysia. The high illiteracy levels shown in tables 35 and 37 are associated with high numbers of unwanted and mistimed children in these countries. In the other countries, India, Bangladesh and the Philippines, married women had more surviving children than their ideal number, and, not surprisingly, stated more often that the last child born was unwanted or mistimed.

The reported child mortality levels, expressed in terms of the average percentage of dead children among children ever born, was equal or slightly higher in fishing communities than in farming communities. This finding conflicts with assertions made elsewhere that living and health conditions in fishing communities were generally worse than in farming communities. If this were indeed true, we should have found more pronounced differences in child mortality levels in the two types of community.

In spite of somewhat higher rates of child mortality in fishing communities, table 38 shows that in all the countries except Tanzania and Bangladesh, the average number of surviving children in fishing families was still higher than in farming communities.

Adult mortality: a comparative perspective

The survey collected limited information on adult mortality in the two communities. Respondents were asked whether their father and mother were still alive and, if not, their age at death. The results are presented in Table 39. Care is required in interpreting the results because of the following: (a) To determine and compare adult mortality levels, age and birth-cohort effects must be taken into account; the required information, e.g. date of death, to do this has not been collected. (b) The debatable assumption must be made that, on average, the age at death of adult men and women who were not parents was the same as the age at death of adults who were parents. (c) The lower the age of the respondent reporting that a parent had died, the lower the expected age at death of the parent. Consequently, if the age distribution of respondents in the two communities differed, average ages at death of parent(s) could not reflect genuine differences in adult mortality levels.

In Table 39, reported ages at death of parents have been standardized, using as covariate the ages of respondents that report that one or both parents have died. Standardized ages take out the effect of differences in ages of respondents in the two community types. These indicators were used to compare countries. In all countries, except the Philippines, adult men in fishing communities died on average at a younger age than men in farming communities. This could be related to the higher occupational health risks involved in coastal fisheries compared to coastal farming. In all countries, except the Philippines and India, adult women seemed to die on average at a younger age than women in farming communities.

Table 39 – Observed and standardized average age at death of parent(s) as reported by respondents mentioning that one or both parents had died

Country	Type of community	Father's age at death (FAD)	Stand-ardized FAD	Mother's age at death (MAD)	Stand-ardized MAD	Number of respondents (N)
Senegal	Fishing	65*	65*	56	59	52
	Farming	73*	74*	61	61	39
Tanzania	Fishing	61	52	61	53	15
	Farming	57	59	55	56	21
India	Fishing	57	63	57*	61*	44
	Farming	64	65	45*	53*	27
Bangladesh	Fishing	64	66	51*	54*	55
	Farming	67	68	59*	62*	52
Malaysia	Fishing	64	64	58	56	13
	Farming	67	68	62	62	19
Philippines	Fishing	69	68	63	64	43
	Farming	62	63	59	62	40

* The difference between fishing and farming households is significant at the 5 percent level.

It is of interest to note that across countries and communities, adult women died at a younger age than adult men, sometimes substantially so. This is contrary to what one would generally find in most countries, because national and sub-national mortality level indicators such as the life expectancy at birth of women state higher values for women than for men. Although the concept of average age at death is different than the concept of life expectancy at birth, the two indicators are often highly correlated. The hypothesis, yet to be further investigated, could be that the socioeconomic and health conditions, particularly for women, are much worse in the studied communities than the average conditions prevailing in the countries and rural areas as a whole.

Migration and isolation: a comparative perspective

At the beginning of chapter 1, attention has been drawn to the fact that in the literature coastal fisherfolk have often been described as living in settlements which are more isolated than those of other rural communities. Given the mostly "open-access" nature of coastal fisheries, fisherfolk may have more reason than farmers not to welcome potential competitors in the catching, handling and trading of fish. In four of the six countries, eligible respondents were asked whether they had been born and raised in the village. This enables identifying and counting the lifetime immigrants and therefore provides some indication of the degree of openness in the communities.

Table 40 shows that the fishing communities did not seem more closed than the nearby farming communities. In three of the four countries, the percentages of lifetime male immigrants in fishing communities were slightly higher than in farming communities. In Tanzania and the Philippines, about one fourth of the male respondents in fisherfolk households were lifetime immigrants. Much smaller percentages of immigrants were observed in the Indian and Bangladesh fishing communities, perhaps because coastal artisanal fisheries there are almost exclusively the domain of the lower caste Hindus. In Bangladesh, because the non-fishing communities are mostly Muslim, fishing communities may not attract migrants. Overall, the female percentages of lifetime immigrants were much higher than those of the male, probably because women traditionally move to their husband's home after marriage. Finally, in all four countries, the differences between the degrees of isolation, or openness to migration, experienced by the two types of community, were smaller than generally thought.

Table 40 – Percentage of lifetime immigrants in fishing and farming communities among male (aged 15-64) and female (aged 15-49) respondents at the time of the survey

Country	Male				Female			
	Fishing	N	Farming	N	Fishing	N	Farming	N
Tanzania	26	103	34	71	42	77	42	72
India	4	115	0	83	26	118	37	80
Bangladesh	8	104	5	101	45	103	46	100
Philippines	28	134	26	127	44	93	34	73

In the fishing communities studied, a number of households had different household income sources from non-fisheries industries, such as farming, livestock and service sector work. Across countries, variation is observed in socioeconomic and demographic conditions of households in fishing communities. This reflects expected variations in levels of development and demographic conditions. In all the countries, except Senegal and the Philippines, fisherfolk households were worse off regarding perceived living conditions and ownership of production and household assets than farming households. Moreover, excluding Senegal, fisherfolk households in all countries were somewhat larger than farming households. Reports from focus group discussions suggest that fisherfolk more often lived in an extended or joint family structure because preference, for artisanal fisheries-related work, was given to kin-based groups.

Conclusions

The surveys showed that fertility and mortality in fishing communities are not very different from those in farming communities. The indicators are higher in the former type of communities, but the differences are small. In addition, higher fertility is compensated by higher childhood and adult mortality, so that the resulting natural population growth rates are quite similar. In the context of accepted theories of the economic determinants of fertility, this indicates that the economic value of children and family labour in general is similar in both types of household. In other words, there does not seem to be a specificity of fishing households with regard to the intensity of need for family labour, be it for fishing as such or for income diversification and security.

The patterns of family labour utilization observed in both the fisherfolk and farming households studied involved some members taking on other activities than fishing (be it in main or secondary fashion). The typical reasons for this are that other income sources are more rewarding, or more stable, and that diversifying income sources is an insurance against income fluctuations and/or failure. The surveys provide some supporting evidence for this: fishermen and their sons often mentioned that they had sought work outside the fisheries and/or farming, particularly in areas where the fisheries is no longer perceived to be a profitable undertaking (Groenewold, 1998).

Desk studies have shown that the rate of population growth among fisherfolk generally was high, and fluctuated widely, in the areas covered by the Project and during the period concerned.[34] When one examines the factors of growth through the surveys, however, it emerges that the differences, and changes over time, in fertility, mortality and natural growth (i.e. the excess of births over deaths) are not consistent with the observed differences and changes in the overall pace of fisherfolk

[34] Given the age distribution of women surveyed, the fertility and childhood mortality characteristics reported here should be taken to reflect mostly the experience of the period from 1980 to 1996.

growth. In fact, population growth rates were higher, or accelerated, where and when labour transfers to the fisheries sub-sector occurred because fisheries was perceived as a profitable undertaking and accessible to newcomers. In other words, changes in livelihoods, motivated by the need to alleviate poverty, were responsible for rapid growth rates of fisherfolk. Conversely, fisherfolk populations tended to stagnate in areas where and when the fisheries was not considered profitable, especially if additional or alternative occupations were not available locally.

Looking ahead, such observations suggest that numbers of fisherfolk should be expected to increase or decline primarily depending on whether fisheries are profitable or not and fisherfolk have access or not to alternative livelihoods for their sustenance.[35] As for the natural growth factor (fertility and mortality), what could be the effect of fertility control and reproductive health programmes on population growth in fisherfolk populations? One should be aware that the said effect might be limited where there exist strong economic incentives to move into the fishing sector, at least where migration and/or intersectoral mobility are easy. Obviously, this detracts nothing from the fact that those programmes are entirely justified on the basis of individual and family health and human rights. In this respect the poorer communities require attention in order to catch up with the rest.

From the demographic viewpoint, migrant flows induced by changes in livelihoods certainly accelerate population growth in the areas of destination. The survey was not geared to measure migration flows and therefore does not allow an in-depth analysis of their role in the rapid growth of the fisherfolk populations studied. But that role is widely acknowledged locally in most cases. In addition, a change of residence is not a necessary condition for becoming involved in coastal fisheries: rural dwellers living in coastal communities may find work in artisanal fisheries to supplement their income without changing their residence.

Rural households, including fisherfolk, must not be perceived as stagnant entities, but as dynamic decision-making units. Some of the households studied demonstrated the capacity to successfully implement livelihood diversification strategies to cope with income fluctuations and poverty. However, it is understood that there may not exist local alternatives to fishing. In such situations, fisherfolk are forced to continue to work in fisheries, or to migrate to urban areas. The lack of access to alternative income sources for fisherfolk is of major concern to policy makers. It contributes to the exploitation of marine natural resources above the level that would occur if alternative livelihoods and income sources were available to fisherfolk. Moreover, the fact that some fisherfolk remain in the sector against their will negatively affects the incomes of all fishers.

Overall, at subsequent points in time, change in rural livelihood affected the number of full/part-time fishermen and their households. Therefore, in addition to demographic factors, the observed national and sub-national growth rates will be affected by the changes in the main and secondary livelihoods of rural households that responded to perceived profitability of existing and new livelihood opportunities, including fisheries. Households previously characterized as farming households may become fisherfolk households and vice versa.

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[35] In India, alternative sources of household income were present in the form of wage labour in the industry and services of nearby urban areas. The numbers of fisherfolk have stagnated and are declining. In the Philippines, such alternatives are absent near the communities that were investigated, and the number of fishers will continue to grow in spite of declining catches per unit of effort and marginal costs that exceed marginal financial benefits.

6. FISHERFOLK'S PERCEPTION OF CHANGES IN THEIR DEMOGRAPHIC STATUS, COASTAL ENVIRONMENT AND FISHERIES RESOURCES

By A. Marcoux

Introduction

Part of the Project investigation was meant to assess the perceptions of fisherfolk (males and females) on population dynamics and the state of the coastal environment and fisheries resources, including any differences in those perceptions between generations or between sexes. Views were also sought on what policies should be to preserve fisheries and coastal resources, and on the efficiency of government policies so far. This chapter reports on the above issues, drawing on the findings of the focus group discussions and on the household surveys.

Assessment of local population dynamics and its factors from the focus group discussions

The focus group discussions held in the villages sought among other things to assess the overall views of population dynamics by the people in the communities surveyed. A set of questions dealt with the perception of population growth and the age composition of the population. Another dealt with overall attitudes regarding marriage, fertility and family planning. It will be reminded that four separate group discussions were held in each village, respectively with older and younger males and females.

Fishing villages only are reported on here, as not all country teams implemented the group discussions in the farming villages selected for comparison. Indirectly, the discussions brought into focus people's views on various factors of population change, including migration, and how population dynamics related to local resources and the environment.

The Philippines

All the groups perceived an ongoing population growth, except the younger men, who equated the perceived decline in fertility with a population stagnation. The women perceived a more rapid growth than the men, but both categories eventually described the area as "overcrowded". The root cause of the population expansion (the more rapid decline in mortality and the consequent fertility-mortality gap), however, was not perceived.

It was recognized that families had become smaller. Because of the high cost of living and limited natural resources, many couples practiced family planning. (The advantages of family planning for the health of women and children were not mentioned.) The advantages of having a large family in terms of labour availability and old age security was recognized, however. The crux of the matter is that the potential advantages were considered increasingly difficult to reap in a "modernizing" society. On the age of marriage, opinions varied. It is interesting to note that in all cases a girl's marriage before age 20 was deemed premature. The perception of the age structure of the population and its changes was realistic: there were more young people, but their relative importance was decreasing.

Malaysia

Questions on population growth were dealt with in a slightly different manner in Malaysia, namely in terms of the increase in fishers (and of farmers in farming villages).

People's views were very much affected by the economic situation. The fisherfolk population (along with the general population), was seen to be increasing, partly because of immigration, and partly because younger people had no alternate livelihood. In farming villages, most people felt that mechanization, off-farm employment and old age had caused a decline in the number of farmers.

In both types of village, opinions of male and female respondents on family size differed. The older men, especially, did not think there was much change in fertility. The women clearly saw a decline. The question of preferences for children of one or the other sex was also discussed. Older male and female respondents preferred male children, because of their greater contributions as family helpers. The younger generation had no marked preference, except that a number of the younger women preferred daughters to assist them with their own chores.

India

The villagers' views were very similar across age and gender groups. Everyone agreed that there had been considerable increase in the population, but that despite this the socioeconomic conditions had also improved.

The age structure was correctly perceived as being young – although, because of better survival rates, there also were more elderly people than before. Having a small family (2-3 children) was considered beneficial, considering the limit in available resources. There was also consensus of opinion on the relatively low "appropriate" age of marriage for girls (18 years).

The preference for male children was widespread, however, except that the younger women had no preference. Family planning was generally practiced, but its burden rested mostly on the women (older women resorted more to abortion and younger women to sterilization).

Tanzania

The question of overall population growth was not discussed. Family sizes were large and approved of by the older people. Younger people were less positive, owing to economic difficulties. However, the idea of family planning was far from being accepted, let alone practiced.

Assessment of changes in level of resource exploitation and in the state of the coastal environment

Four questions were asked in the household survey to determine people's views on changes in fisheries resources and the coastal environment. Responses to those questions are synthesized below, in tables 41 to 44.

In five countries out of six, fisherfolk were extremely pessimistic regarding change over time in total catch, as well as in the variety of fish captured (the exception being Malaysia). Between 85 and 96 percent of the male fisherfolk in the five countries concurred that total catch and variety had declined. In Malaysia, only about half of the male fisherfolk agreed. Female respondents often differed significantly with their male counterparts: they were more pessimistic of the change in total catch in all countries except Tanzania, and on the variety of catch in all countries, except India and Tanzania.

People had negative impressions of changes in the size of fish caught, although less so than on total catch and variety. The exception again was Malaysia, where only a minority of the male respondents thought that the situation had deteriorated. In the other countries, between 76 and 93

percent were negative. Female respondents were more pessimistic than males, except in India and Tanzania.

Caution is required when commenting on differences of opinion by sex. However, the women's views of variety and size of catch might deserve particular attention, considering that women were often involved in fish processing and marketing. Nevertheless, in two cases the statistical value of the information is diminished, because there were very few female respondents.

The fourth question dealt with the pollution of coastal waters. The opinions of male respondents were still predominantly pessimistic, but less so than on the other issues. This time, because Malaysian respondents considered pollution to be the most important of the problems, the consensus was practically in line with their colleagues in the other countries. The pattern of differential response by females and males was identical to that found earlier.

A direct link does not necessarily exist between the size of the population and the variables which ultimately affect fisheries resources, namely the number of fishers and the number (or capacities) of fishing vessels. Therefore, the opinions and attitudes assessed do not refer to "population pressure" as such. However, inasmuch as the communities were engaged mainly in subsistence activities and as local fisheries resources were affected mostly by those communities – the link between population size and the scale of fishing activities is at any rate relevant to possible elements of change.

The surveys clearly indicated that a causal relationship was perceived between the increase in fishing activities at sea and several parameters (catch, variety and unit size), the results of which are important for the productivity and the sustainability of fisheries. The demographics will be put into perspective later on, along with the specific attitudes of the people surveyed.

Perception of the need for regulations and effectiveness of environmental policies

The issue examined the people's perceptions of needed and actual government policies on the conservation of the environment and the management of fisheries resources. The findings were largely consistent across countries.

One of the questions asked was whether respondents agreed with the idea that "strict regulations should be introduced to regulate the type of fishing gear used on the various fishing grounds". An overwhelming majority of respondents agreed – typically 80 percent or more – with no significant gender difference. This is all the more interesting as regulations of this nature potentially affect all operators, hence the respondents themselves.

Two of the questions asked were whether respondents agreed with the statement that the government had taken "adequate steps for the conservation and protection of the fisheries resources and the coastal environment in the region. Opinions on this score were usually mixed, and levels of approval and disapproval within a country were of the same order of magnitude. Therefore, by and large, there seems to be room for a more extensive intervention of governments in fisheries protection. A deeper comment seems impossible, as the answers would have to be interpreted in the context of each government's actions. Details would have to be sought on which aspects of those actions were deemed adequate and which were not.

Table 41 – Percentage of respondents, by sex, agreeing that "total catch has seriously declined owing to increasing number of fishers and boats"

Country	Males	Females	Both
Philippines	91.1	*	91.8
Malaysia	49.7	60.7	55.2
Bangladesh	87.9	*	87.0
India	96.1	97.1	96.5
Tanzania	87.8	75.0	86.0
Senegal	96.3	100.0	97.6
* Value omitted: too few respondents.			

Table 42 – Percentage of respondents, by sex, agreeing that "the variety of fish has seriously declined owing to increasing number of fishers and boats"

Country	Males	Females	Both
Philippines	92.2	*	92.9
Malaysia	53.7	57.7	55.7
Bangladesh	84.6	*	84.8
India	86.8	70.6	79.2
Tanzania	86.7	68.7	84.2
Senegal	94.2	97.0	95.2
* Value omitted: too few respondents.			

Table 43 – Percentage of respondents, by sex, agreeing that "the size of fish caught has seriously declined owing to increasing number of fishers and boats"

Country	Males	Females	Both
Philippines	78.9	*	89.6
Malaysia	38.9	50.3	44.6
Bangladesh	86.8	*	85.9
India	76.3	75.0	75.7
Tanzania	79.6	56.2	76.3
Senegal	92.7	98.0	94.5
* Value omitted: too few respondents.			

Table 44 – Percentage of respondents, by sex, agreeing that "the quality of seawater has seriously declined owing to industrial waste, sewage, household waste and pollution from ships"

Country	Males	Females	Both
Philippines	60.0	*	60.2
Malaysia	57.4	73.0	65.2
Bangladesh	61.5	*	62.0
India	69.7	67.6	68.8
Tanzania	65.3	43.7	62.3
Senegal	81.7	85.9	83.1
* Value omitted: too few respondents.			

7. SOCIOECONOMIC CHARACTERISTICS, LIVELIHOODS AND FERTILITY

By G. Groenewold

Introduction

In this chapter, we examine the influence of some socio-economic characteristics, including people's livelihoods, on fertility. More specifically, we consider the linkages between gender, education, household financial situation, perceived poverty and the ownership status of major means of production on the one hand, and the number of children ever born (CEB), the perceived ideal number of children, and the perception of what constitutes a small family, on the other hand. The perceived financial situation of the household is correlated with the perceived poverty status; nevertheless, we use both variables because the former relates to the perceived capacity to provide for the basic food and water supplies, while the latter is indicative of whether households feel financially deprived, compared to the other households in their environment.

The focus is on four of the six countries: Senegal, India, Malaysia and the Philippines. This decision is based on the following considerations: (a) the limitations of survey data from Tanzania and Bangladesh as discussed in chapter 4 pose conceptual problems to which the analyses of this chapter are sensitive; (b) previous analyses revealed that the households of these two countries do not differ much between types of community regarding the number of children ever born and children surviving (see tables 35 and 37).

We are primarily interested here in assessing the influence that the selected socioeconomic factors may have on fertility, within the two community types respectively. Therefore, results are not standardized for differences in age distribution between community types.

The analyses are based on information from married male and female respondents. However, in the Philippines, the values in tables 45, 46 and 47 are based on data from all the women aged 15-49, because of the low number of married women actually interviewed. The shaded areas in the tables indicate that the characteristic was not an important element of livelihood in the community (e.g. the use and ownership status of agricultural land by fisherfolk in fishing communities). Moreover, the stated values in these shaded areas are frequently based on a small number of respondents.

Observed fertility: children ever born

In all the countries and practically all the communities studied, women with higher levels of education had on average a lower number of births, particularly in Senegalese and Malaysian fishing communities. Moreover, in all the communities, except in Senegalese farming communities, there was a substantial difference in women educated above primary school level. Women with a secondary education or higher reported fewer births than women with no or only a primary school education. Overall, the education factor affected the number of childbirths in both types of communities to about the same degree.

With the exception of fisherfolk households in Senegal, women in households who perceived the financial situation of the household to be satisfactory had lower fertility levels. Conversely, women in the poorest households had more children. Focus group discussions in Senegal and Malaysia mentioned the pros and cons of having many children. In the absence of institutional old-age support, parents expected financial support from their children, especially from sons. Table 45 suggests that this is more prevalent among poor fisherfolk households than among poor farming households. The exception to this was the women in richer fisherfolk households in Senegal who

had more children than women from poorer households. This finding may not be unexpected because, as we have seen in the previous chapters, fisheries in Senegalese communities were perceived to be very profitable. Having more children, especially sons, could further contribute to the family welfare, especially among boat owners and kin-based work groups. As shown in Table 45, fisherfolk households that owned or shared boats had more children than non-owners of this essential means of production. Senegalese fishing households also stated the highest ideal number of children, and reported the highest standard concerning the number of persons deemed to constitute a 'small' family.

Table 45: Average number of children ever born to married women in fishing and farming communities according to selected background characteristics

Characteristic	Senegal		India		Malaysia		Philippines [36]	
	Fish.	Farm.	Fish.	Farm.	Fish.	Farm.	Fish.	Farm.
Age group:								
15-19	1.3	2.0	(a)	(c)	(a)	(c)	0.0	0.1
20-24	2.3	2.0	1.2	2.0	0.5	(b)	1.0	0.7
25-29	3.2	3.2	2.4	2.0	0.5	0.7	1.9	1.5
30-34	4.3	4.2	3.3	2.4	0.9	0.9	3.8	5.5
35-39	4.9	4.7	3.8	4.0	2.0	1.2	5.0	4.1
40-44	5.6	6.5	3.9	2.7	2.2	1.9	5.4	3.4
45-49	7.9	4.3	4.7	3.5	1.4	1.5	4.2	3.7
Level of education of respondent								
Illiterate/Pre-school	4.1	3.8	3.6	3.0	2.2	1.7	(a)	(c)
Primary	3.7	3.5	3.6	3.3	1.4	1.3	3.6	4.0
Secondary and higher	2.7	5.3	2.5	2.3	0.7	0.8	2.7	2.1
Financial situation of household								
Sufficient	4.7	2.8	3.0	2.4	1.2	1.1	2.6	2.1
Barely sufficient	3.2	3.0	3.7	3.2	1.3	1.3	3.7	2.6
Insufficient	4.3	4.2	3.9	2.8	1.4	1.1	3.0	2.1
Financial situation of household relative to other households:								
Better off	4.8	3.9	3.0	2.4	1.1	0.8	4.9	4.5
About the same	3.6	3.7	3.3	2.8	1.3	1.2	2.8	2.1
Worse off	5.1	3.7	3.8	2.8	1.0	0.8	3.2	3.0
Household ownership of agricultural land:								
Operates own land	3.4	3.9	(c)	2.8	0.8	1.0	2.2	2.6
Operates rented land	(a)	3.4	(c)	2.9	1.1	1.2	2.8(b)	2.3
Does not operate land	3.9	3.7	3.3	1.8	1.2	(c)	3.0	(a)
Household ownership of boats:								
Owns boats								
Shared ownership of boats	4.4	(c)	3.1	(c)	1.1	1.3	2.8	(a)
No ownership of boats	4.6	3.3	3.2	(c)	1.0	(a)	1.4	(c)
	3.3	2.9	3.4	2.2(b)	1.3	1.4	3.8	(c)

a) The average value is based on a very small number of respondents (less than five) and is not reported.
b) The average value is based on a small number of respondents (five to 10).
c) There are no respondents with this characteristic.

[36] Due to the small number of eligible married women that were interviewed the analysis uses data from all women, instead of all married women. The number of children ever born by the older women is likely to be underreported, because (particularly in the farming communities of the Philippines) they asserted to have given birth to fewer children than the younger women. The values of the average of children ever born to women should show a gradual increase with increasing age.

Fisheries in India and the Philippines were no longer perceived to be a profitable livelihood. The strong relationship between fertility and ownership of boats observed in Senegal was not present. Concomitantly, the ideal number of children was about the same, or even less than the ideal number stated by non boat-owners. A similar pattern was observed among farmers. Women in farming households who owned and farmed their land had more children than those who rented farmland or had no land (i.e. agricultural labourers).

Fertility norms: ideal number of children

The ideal number of children reported by respondents tells something about their fertility aspirations. As can be verified in Table 46, in all communities and irrespective of community type, younger people reported a lower ideal number of children than older people. These differences are greater among fisherfolk than among farmers.

The education level of a respondent seemed to affect his/her fertility aspirations: an education above primary school is associated with significantly lower fertility aspirations. This effect is correlated with that of age, to the extent that younger generations are better educated.

Overall, the fertility aspirations of men were much higher than those of women, particularly among fisherfolk. The consequence of this, given the generally low status of women in the households, is that fertility aspirations of husbands may eventually cause women to have more children that they desire, as shown in tables 35 and 37.

There is no consistent relationship between the two poverty indicators ("perceived financial situation of the household" and "perceived financial situation relative to other households") and fertility aspirations across countries. However, this may be due to the influence that some underlying factors have on such relationships, such as the "perceived profitability of the livelihood". For instance, in Senegal, where fisheries was perceived to be a profitable undertaking, households that thought themselves financially worse-off or better-off expressed a higher ideal number of children.

In an environment where having more children is thought to be economically advantageous, people worse-off or relatively better off thought they gained the most by having many children. In India, Malaysia and the Philippines, however, fisheries were no longer perceived to be a profitable undertaking. Households that considered themselves financially better off in absolute and relative terms, such as those who owned boats, focused more on the net cost of children and the threat this posed to their household income. These households expressed a lower ideal number of children.

Conversely, the poorest and most deprived households did not consider the net cost of children, but how children could contribute in the future alleviation of poverty and the aversion of further financial risks in their parents old age. Consequently, this type of household expressed a high ideal number of children.

The relationship between the ideal number of children and indicators of poverty and ownership status of the main production assets is supported by the data in table 46.

Table 46 – Average ideal number of children reported by married women and men in fishing and farming communities according to selected background characteristics

Characteristic	Senegal		India		Malaysia		Philippines [37]	
	Fish.	Farm.	Fish.	Farm.	Fish.	Farm.	Fish.	Farm.
Age group:								
15-24	6.9	9.6	2.1	2.3(a)	4.6	4.3	3.1	2.7
25-34	9.3	8.6	2.4	2.3	5.1	5.1	3.8	4.1
35-44	10.8	8.6	2.8	2.3	5.9	5.2	4.2	5.2
45 and above	15.6	16.1	3.2	2.6	7.0	5.8	5.1	4.3
Sex of respondent:								
Male	12.2	12.0	2.9	2.4	6.6	5.8	4.3	4.0
Female	8.1	8.4	2.5	2.3	5.5	5.1	3.6	3.0
Level of education of respondent:								
Illiterate/Pre-school	10.9	10.3	2.9	2.4	6.5	5.1	4.0	3.8
Primary	9.4	6.0	2.7	2.9	6.4	5.9	4.6	4.3
Secondary and higher	5.3	9.8(a)	2.5	2.2	5.2	5.1	3.6	3.4
Financial situation of household:								
Sufficient	11.7	12.3	2.6	2.4	6.0	5.5	3.9	3.7
Barely sufficient	8.9	8.6	2.7	2.3	7.8	5.5	4.2	3.7
Insufficient	11.6	10.6	2.8	2.5	5.9	5.1	4.5	3.8
Financial situation of household relative to other households:								
Better off	9.2	14.6	2.5	2.4	5.6	5.9	4.1	4.6
About the same	11.1	9.5	2.7	2.4	6.1	5.5	3.9	3.7
Worse off	7.3	8.3	2.8	2.3	5.7	5.0	4.2	3.8
Household ownership of agricultural land:								
Operates own land	12.6	9.4	(c)	2.4	6.0	5.3	4.4	3.7
Operates rented land	(b)	11.2	(c)	2.4	5.8	5.6	4.4	3.7
Does not operate land	9.3	12.0	2.7	2.1	5.9	(c)	3.9	3.5
Household ownership of boats:								
Owns boats	12.8	(c)	2.5	(c)	6.1	5.6	4.1	(b)
Shared ownership of boats	10.9	13.0	2.6	(c)	7.0	5.5	3.1	(c)
No ownership of boats	7.6	(c)	2.8	2.3	6.0	6.5	4.2	(c)

(a) The average value is based on a small number of respondents (5 to 10).
(b) The average value is based on a very small number of respondents (less than 5) and is suppressed
(c) There are no respondents with this characteristic.

Perceptions of family size

The survey collected information on what number of persons the respondents felt representative of a 'small family' (see Table 47). Knowledge of people's attitudes in this area is potentially important for policy makers and programme implementers, because population and development programmes that seek to affect fertility levels directly (family planning) or that do so indirectly (poverty alleviation) will be more successful, other things being equal, in environments where family size standards are low, compared to attained average fertility levels.

[37] Due to the small number of eligible married women that were interviewed the analysis uses data from all women, instead of all married women. The number of children ever born by the older women is likely to be underreported, because (particularly in the farming communities of the Philippines) they asserted to have given birth to fewer children than the younger women. The values of the average of children ever born to women should show a gradual increase with increasing age.

Table 47 – Perception of what constitutes a small family among married women and men in fishing and farming communities according to selected background characteristics

Characteristic	Senegal		India		Malaysia		Philippines [38]	
	Fish.	Farm.	Fish.	Farm.	Fish.	Farm.	Fish.	Farm.
Age group:								
15-24	5.5	5.4	1.9	1.3(a)	2.6	2.0	2.6	2.8
25-34	6.3	4.8	2.0	1.9	2.7	2.3	2.8	2.9
35-44	8.5	4.9	2.1	1.9	2.9	2.4	2.5	5.6
45 and above	7.8	5.6	2.8	2.2	2.8	2.2	3.0	3.0
Sex of respondent:								
Male	6.8	5.5	2.3	2.0	2.8	2.1	2.7	2.8
Female	6.2	4.8	2.1	2.0	2.8	2.4	2.7	2.8
Level of education of respondent:								
Illiterate/Pre-school	6.6	5.0	2.5	2.0	2.3	2.2	(b)	(b)
Primary	7.7	4.8	2.0	2.3	2.9	2.4	3.0	3.0
Secondary and higher	3.8	4.3	2.0	1.8	2.7	2.0	2.5	2.7
Financial situation of household:								
Sufficient	4.8	7.8	2.3	2.0	2.8	2.3	2.6	2.7
Barely sufficient	4.8	4.5	2.1	1.7	3.0	1.6	2.8	2.8
Insufficient	8.4	5.0	1.9	2.3	3.0	2.2	2.9	3.0
Financial situation of household relative to other households:								
Better off	5.8	7.6	2.2	1.8	3.6	2.1	2.8	(b)
About the same	7.0	5.0	2.3	2.1	2.8	2.3	2.7	2.8
Worse off	4.6	2.5	2.2	1.9	2.8	1.9	2.8	2.8
Household ownership of agricultural land:								
Operates own land	7.9	5.0	(c)	1.7	3.0	2.3	2.4	2.8
Operates rented land	8.3	5.4	(c)	2.0	2.5	2.2	2.7	2.9
Does not operate land	5.8	4.5	2.2	1.8	2.8	(c)	2.8	(b)
Household ownership of boats:								
Owns boats								
Shared ownership of boats	8.0	c)	2.2	(c)	2.9	2.1(a)	2.7	(b)
No ownership of boats	3.5	6.9	2.6	(c)	2.6(a)	(b)	2.5	(c)
	3.8	6.5	2.2	2.2	2.8	2.7	2.8	(c)

(a) The average value is based on a small number of respondents (5 to 10).
(b) The average value is based on a very small number of respondents (less than 5) and is suppressed.
(c) There are no respondents with this characteristic.

The findings on 'small family' size norms are largely consistent with those on the ideal numbers of children. Except in Senegal, in all the communities the perception of what constitutes a small family hovers between two and three children. Consistent with previous findings, younger and more educated respondents placed the 'small family' level lower than older and less educated respondents. Moreover, men, particularly fishermen, had on average higher 'small family' norms than women.

In Senegal, the community fertility levels, ideal number of children and 'small family' norms are much higher than in the other countries: there, a 'small family' may consist of four to eight persons. The fact that polygamous marriage arrangements are quite common in Senegal influences the concept of how many persons make up a small family. The concept of family, therefore, is probably

[38] Due to the small number of eligible married women that were interviewed the analysis uses data from all women, instead of all married women.

interpreted as a household consisting of more than one nuclear family, in which the nuclei may even reside in different geographical places (i.e. multi-residential households).

No consistent and easily interpretable pattern was observed in the values of the 'small family' norm of households that had a different level of poverty and a different ownership status of the principal means of production.

Conclusions

Across countries and communities, it was observed that the higher education level of women was associated with fewer births, particularly if women were educated above primary school. It would be useful to understand what views and attitudes regarding the costs and benefits of children, or their emotional value – or indeed any other factor – are modified under the influence of education.

Although women in households who perceived their financial situation to be "sufficient" generally had less children, the same pattern was not always observed among those who considered their household to be "better off" than others. In fact, the patterns were not always very consistent; this may be due to the variability associated with small numbers of respondents and the effect of other factors such as age.

Based on the above-mentioned findings, it is hypothesized that the relationship between the number of children, poverty indicators and ownership of the main production factor may be affected by the underlying factor "perceived profitability of the livelihood". In countries where the livelihood is considered to be a profitable undertaking, the number of children born and the ideal number of children was higher and the son preference was stronger, especially in households that owned the crucial means of production: boats and/or land. The levels of such indicators of fertility were lower when perceived profitability of the livelihood was low, particularly among those who owned their principal means of production. This hypothesis needs further refinement and investigation, taking into account the poorest and most deprived households.

8. ATTITUDES AND BEHAVIOUR CONCERNING FAMILY FORMATION AND THE USE OF NATURAL RESOURCES

By A. Marcoux

Introduction

This chapter examines the relationship between the attitudes and behaviour of male and female fisherfolk concerning marriage, fertility and contraception, and changes in fisheries resources and the coastal environment. The question was: Do people who show greater sensitivity and concern for environmental issues, also have different views on marriage and fertility practices?

Specifically, we examine how the respondents' views on the appropriate age of marriage for women and men, the number of children they wish to have, and the knowledge and use of family planning methods were related to:

- the perception of a link between the state of natural resources and their welfare and number of children;
- the awareness of a decline in fisheries resources;
- the awareness of environmental pollution;
- the awareness of a need for protection of natural resources;
- personal activity to preserve/improve resources and the environment.

Perceived ideal age of marriage for women and men

The first survey was to determine a possible association between individual views on the appropriate age of marriage males and females - and opinions on environmental issues. The survey was carried out in four countries: the Philippines, Bangladesh, India and Senegal. Regarding environmental awareness and concern, respondents were classified according to whether they agreed or not that: jobs, natural resources and human fertility were related; there has been a decline in fish catches; there has been a decline in the quality of seawater; there is a need for measures to regulate fishing gear. They were also asked if they had personally taken steps to protect local resources (see tables 48 to 52 below).

Table 48 – Average declared appropriate age of marriage for males and females, by respondents' opinion of the proposition that population, resources and employment are related

Country		Appropriate age of marriage (average)	
		For males	For females
Philippines	Agrees	27.1	24.0
	Disagrees	25.3	23.5
Bangladesh	Agrees	26.9	18.0
	Disagrees	27.9	19.0
India	Agrees	23.4	19.0
	Disagrees	22.6	18.8
Senegal	Agrees	22.7	16.1
	Disagrees	25.8	17.8

Table 49 – Average declared appropriate age of marriage for males and females, by respondents' opinion of the proposition that fish catch decreased owing to increasing numbers of fishers and boats

Country		Appropriate age of marriage (average)	
		For males	For females
Philippines	Agrees	27.1	24.0
	Disagrees	25.3	23.5
Bangladesh	Agrees	26.6	17.7
	Disagrees	27.3	17.4
India	Agrees	22.6	18.7
	Disagrees	23.6	19.1
Senegal	Agrees	22.9	16.2
	Disagrees	33.9	17.2

Table 50 – Average declared appropriate age of marriage for males and females, by respondents' opinion of the proposition that the quality of seawater deteriorated because of pollution

Country		Appropriate age of marriage (average)	
		For males	For females
Philippines	Agrees	26.9	23.7
	Disagrees	27.2	24.4
Bangladesh	Agrees	26.7	17.5
	Disagrees	26.5	18.1
India	Agrees	22.7	18.6
	Disagrees	22.6	18.8
Senegal	Agrees	23.4	16.2
	Disagrees	29.5	16.3

Table 51 – Average declared appropriate age of marriage for males and females, by respondents' opinion of the proposition that measures should be taken to regulate fishing gear

Country		Appropriate age of marriage (average)	
		For males	For females
Philippines	Agrees	27.0	24.0
	Disagrees	25.0	22.7
Bangladesh	Agrees	26.8	17.7
	Disagrees	25.1	17.4
India	Agrees	22.6	18.6
	Disagrees	21.9	18.8
Senegal	Agrees	23.5	16.2
	Disagrees	21.7	16.7

Table 52 – Average declared appropriate age of marriage for males and females, by respondents' record of having personally taken or not taken steps to contribute to resource protection

Country		Appropriate age of marriage (average)	
		For males	For females
Philippines	Has taken steps	26.8	24.3
	Has not	28.8	24.8
Bangladesh	Has taken steps	*	*
	Has not	26.7	17.6
India	Has taken steps	22.9	18.8
	Has not	22.6	18.7
Senegal	Has taken steps	22.2	15.8
	Has not	23.6	15.9
* no respondent in this category			

It was expected that individuals more concerned with environmental issues would choose an older appropriate age for marriage, however, such an association was not observed:

- In all but a few instances, the differences between the average age at marriage indicated by the two categories of respondents were minimal – generally much smaller than the standard deviation of response with respect to the said average.
- In addition, in more than half of the instances, the result was of the counter-intuitive type, suggesting that opinions on age at marriage were influenced by much more powerful factors than one's views of local natural resources.

The differences between the countries were clear. The age of marriage deemed appropriate for males was markedly higher in the Philippines and Bangladesh (usually 25-27) than in India and Senegal (usually 22-23). The age for females was lower than for males in all instances, but the difference is much smaller in the Philippines and India (usually three to five years) than in Bangladesh and Senegal (usually six to 10 years).

Desired number of children

The same survey was carried out on the respondents' declarations concerning the number of children they personally desired: see tables 53-57 below. No correlation can be found between the degree of awareness of environmental issues and their relationship with population dynamics (or of personal concern) and the preference for larger or smaller families.

Table 53 – Average desired number of children, by respondents' opinion on the proposition that population, resources and employment were related

Country	Desired number of children (average)	
	Agrees	Disagrees
Philippines	3.9	3.9
Bangladesh	4.3	4.0
India	2.7	2.6
Senegal	10.0	23.2

Table 54 – Average desired number of children, by respondents' opinion on the proposition that fish catch decreased owing to increasing numbers of fishers and boats

Country	Desired number of children (average)	
	Agrees	Disagrees
Philippines	4.1	4.0
Bangladesh	3.8	3.5
India	2.7	2.3
Senegal	11.8	4.2

Table 55 – Average desired number of children, by respondents' opinion on the proposition that the quality of seawater deteriorated owing to pollution

Country	Desired number of children (average)	
	Agrees	Disagrees
Philippines	3.8	4.3
Bangladesh	3.8	3.7
India	2.6	2.7
Senegal	9.2	27.4

Table 56 – Average desired number of children, by respondents' opinion on the proposition that measures should be taken to regulate fishing gear

Country	Desired number of children (average)	
	Agrees	Disagrees
Philippines	4.1	3.7
Bangladesh	3.8	4.2
India	2.7	2.4
Senegal	11.5	15.0

Table 57 – Average desired number of children, by respondents' record of having taken or not personal steps to contribute to resource protection

Country	Desired number of children (average)	
	Has taken steps	Has not
Philippines	4.5	4.0
Bangladesh	*	3.7
India	2.4	2.7
Senegal	9.5	13.6
* no respondent in this category		

The purpose to verify whether or not environmental concerns linked to population change translated into individual demographic behaviour, i.e. whether or not respondents showing more awareness or

The purpose to verify whether or not environmental concerns linked to population change translated into individual demographic behaviour, i.e. whether or not respondents showing more awareness or concern desired fewer children. This proved not to be the case: a difference is observed in about half of the instances, and the opposite in the other half.

Therefore it is clear that desired family size is influenced by much stronger factors than attitudes on environmental matters.

Use of family planning methods

A similar search was performed on the respondents' declarations as to whether they were using a family planning method at the time of the interview: see tables 58-61 below.

Table 58 – Percentage practicing family planning, by respondents' opinion of the proposition that fish catch decreased owing to increasing numbers of fishers and boats

Country	Percentage practicing family planning	
	Agree	Disagreed
Philippines	40.1	27.3
Bangladesh	31.0	45.8
India	70.8	75.0
Senegal	21.0	23.1

Table 59 – Percentage practicing family planning, by respondents' opinion of the proposition that the quality of seawater deteriorated owing to pollution

Country	Percentage practicing family planning	
	Agrees	Disagrees
Philippines	34.0	44.7
Bangladesh	31.6	15.2
India	70.5	78.3
Senegal	20.9	3.7

Table 60 – Percentage practicing family planning, by respondents' opinion of the proposition that measures should be taken to regulate fishing gear

Country	Percentage practicing family planning	
	Agrees	Disagrees
Philippines	38.5	55.6
Bangladesh	36.4	10.5
India	71.7	80.0
Senegal	22.5	33.3

Table 61 – Percentage practicing family planning, by respondents' record of having taken or not personal steps to contribute to resource protection

Country	Percentage practicing family planning	
	Has taken steps	Has not
Philippines	42.9	38.3
Bangladesh	*	32.2
India	63.6	72.1
Senegal	44.0	15.8
* no respondent in this category		

The results confirm the preceding observations. The differences in family planning practices between categories of respondents ("more" or "less" aware/concerned) were large, but they occurred in both directions with similar frequency – i.e. a large percentage of people using contraceptive methods may be found among concerned, as well as unconcerned respondents.

Again, the decision to practice family planning and the assiduity of practice must be primarily dependent on an entirely different set of variables than those regarding fisherfolk's attitudes towards their natural resources and environment.

9. CONCLUSIONS

By U. Tietze, G. Groenewold and A. Marcoux

Demographic trends in fishing communities

The findings of the macro-level studies carried out by the Project suggest that, contrary to the general trend, the number of coastal fishers has started to decline or stagnate in large parts of four of the six countries studied, namely the Philippines, Malaysia, Tanzania and Senegal. (That number is still increasing in India and Bangladesh, but to a much lesser extent than in previous decades.) It will be seen that this diversity is not primarily explained by demographic factors, at least not those of natural growth (fertility and mortality).

Fertility and its factors

When compared with other rural residents, fisherfolk have been found to have slightly higher fertility. This is in line with a set of conscient attitudes towards family formation, which point to earlier age at marriage and higher number of children desired. As has been noted elsewhere, the circumstances of fishing populations are of the kind typically conducive to high fertility: families with an abundant labour force are at advantage in the exploitation of fishery resources – because of open access – and a large offspring facilitates a strategy of diversification of sources of income, which is important because of the aleatory nature and low productivity of fishing (FAO, 1996).

Interestingly, lower fertility among farmers did not seem ascribable to greater wellbeing, since – contrary to a widely held view – it was actually fisherfolk households who were generally better off in the areas studied. It rather seems that family labour is valued in a context where it enables to assemble sufficiently large kin-based work groups that take full advantage of existing income opportunities. In other words, it is hypothesized that the relationship between the number of children, welfare indicators and ownership of production factors is affected by the perceived profitability of the livelihood. In countries where fisheries are considered profitable, the number of children born and the ideal number of children were higher and the son preference was stronger, especially in households that owned the crucial means of production: boats and/or land. The levels of fertility indicators were lower when the perceived profitability of the livelihood was low, particularly among those who owned their principal means of production. This hypothesis needs further refinement and investigation, addressing also the most deprived households.

The relationship between attitudes and behaviour of fisherfolk concerning marriage, fertility and contraception, and their perceptions of changes in fisheries resources and the coastal environment, was also examined. The hypothesis was that people who show greater concern for environmental issues and the role of population growth in these, might have different views on fertility and family planning. This is not the case: ideal age at marriage, desired family size or family planning practice are dependent on a different set of variables than fisherfolk's attitudes towards their natural resources and environment.

Contrary to the simple view that fisherfolk are essentially traditionalist, the Project found that the younger generations have markedly different attitudes from those of their elders regarding fertility and the family. They generally advocate higher ages at marriage, especially for women, see better the advantage of smaller families, and desire lesser numbers of children than their parents. These trends, however, were less accentuated in the two African countries surveyed than in the four Asian ones.

Such changes in attitudes from one generation to the next has probably to do with education factors, since the surveys did show, according to a classical pattern, that differences in fertility were strongly associated with differences in education – especially that of women – and the younger generations were on average more educated than their predecessors.

Mortality and natural population growth

Mortality also is higher in fisherfolk populations than in neighbouring farming populations. One is tempted to attribute this to the hard and dangerous way of living implied by fishing at sea. While plausible, this view is partial, for the Project has also assessed that among women – who do not go to sea in the populations surveyed – the mortality differential between fisherfolk and farmers is greater than among men.

Given the above, natural growth rates are about the same in fisherfolk and farming populations in the areas studied. The differences between those are for the most part ascribable to migration and occupational mobility out of, or into, the fishing population and labour force.

Occupational mobility

The micro-level studies carried out by the Project also suggest that fisheries no longer seem to be a "last resort employment" (as they seem to have been in the 1980s at least in much of Asia) for people in coastal areas, at least not in most of the countries included in the study.

In Malaysia, where there was an overall decline in the number of coastal fishers, this decline is also reflected in an inter-generational occupational mobility out of fishing into other occupations in the service sector (or into unemployment). In the Philippines and Tanzania, where the number of coastal fishers has also started to decline, changes are more recent and the studies still show inter-generational occupational mobility into fishing from other sectors of the rural economy. This is also the case in Bangladesh and India where the number of fishers is still increasing..

A plausible explanation for these changes might be that in many countries, in the context of declining catches and income per fisher on the one hand, and economic growth and rising levels of education on the other hand, alternative and economically more rewarding employment opportunities have developed outside the fisheries sector, facilitating vocational mobility. Government policies aiming at a reduction and limitation of fishing effort, conservation, and the rehabilitation of fisheries resources could also have played a role in forcing fisherfolk out of their traditional occupation.

In all the villages studied, fishing and farming still dominate, but other occupations have become more significant in some countries, such as the Philippines, India and Tanzania. Women are involved in domestic food production and income-generating activities in both fishing and agricultural villages – quite actively in India, Tanzania, Senegal, and less so in Bangladesh, Malaysia and the Philippines.

Income and education

The studies carried out by the Project show another interesting fact, contrary to the popular belief that fisherfolk are the poorest group of the rural population in coastal areas. In five out of the six countries studied, and in spite of declining catches, the average annual household income of fisherfolk households is significantly higher than that of households in neighbouring agricultural villages. The savings rate and the amounts saved were generally higher in fishing villages than in

neighbouring agricultural villages. In most of the countries studied, finally, households in agricultural villages were as indebted or more indebted than households in fishing villages.

Education levels of fisherfolk and agriculturists were equally high in the fishing and farming households studied in the Philippines, and equally low in those studied in Tanzania. In Malaysia and Bangladesh, agriculturists had higher levels of education than fisherfolk, and in India and Senegal, fisherfolk had a higher level of education than agriculturists. Regarding housing standards, households of agriculturists were better off in the four Asian countries studied. In Senegal, fisherfolk were better off, and in Tanzania, housing conditions were equally poor in fishing and agricultural villages.

Perception of environment, resources and economic situation

As to their perception of the state of fisheries resources and coastal environment, the majority of fisherfolk in four of the six countries studied – namely the Philippines, India, Bangladesh and Senegal – acknowledged that resources and the environment had seriously declined and deteriorated because of increases in the number of fishers and fishing boats, and because of domestic and industrial water pollution. Fisherfolk expected the Government to introduce strict regulations and measures for the rehabilitation and conservation of fisheries resources and the coastal environment, and noted that very little had been done so far. Only in Malaysia did the majority of fisherfolk feel that the Government had taken appropriate measures and that the outlook was positive.

Assessing changes in their overall economic situation over the last generation, fisherfolk in the Philippines, Malaysia and India generally saw improvements, while fisherfolk in Bangladesh, Tanzania and Senegal did not. These views took account of perceived changes not only in income and standards of living, but also in infrastructure, public and private services in coastal areas.

Change in livelihoods

Rural households, including fisherfolk, must not be perceived as stagnant entities, but as dynamic decision-making units. Some households had the capacity to successfully implement income diversification strategies to cope with income fluctuations, income failure and poverty. However, it is also understood that there may not be local alternatives to fishing and/or farming. In such situations, fisherfolk are forced to continue to work in fisheries, or to migrate to urban areas. The lack of access to alternative income sources for fisherfolk is of major concern to policy makers. It adds to the exploitation of marine natural resources above the level that would occur if alternative livelihoods and income sources were available to fisherfolk. Moreover, the fact that some fisherfolk remain in the sector against their will negatively affects the incomes of all fishers.

Overall, at subsequent points in time, change in rural livelihoods affected the number of full/part-time fishermen and their households. Therefore, in addition to demographic factors, the observed national and sub-national growth rates will be affected by the changes in the main and secondary livelihoods of rural households that responded to perceived profitability of existing and new livelihood opportunities, including fisheries. Households previously characterized as farming households may become fisherfolk households and vice versa.

Policy perspectives

In the fisheries policy perspective, artisanal fisheries hold a sensitive position because the human dimension is dominant in the analysis of their problems: they concern larger numbers of people, have

implications for the livelihood base of large areas, and potentially large population movements hinge on their profitability and ultimate fate.

For instance, in a framework of "responsible fisheries", an important policy issue is to decide on limitations or downsizing of operations for the relevant sub-sectors (large-, medium- and small-scale).[39] The implications of such a choice differ markedly – in economic and human terms – between e.g. the industrial sub-sector, where the main issue would be the reconversion of capital (vessels and equipment) and the small-scale sub-sector, where the main issue would be the reconversion of labour force to other activities, hence the identification of other sources of livelihood and possibly the migration flows involved (FAO, 1996).

Assessing the implications of such policy options requires adequate knowledge not only of the technical aspects of the sector but also of its actors. It is important, in particular, to know what impact policies addressing the industrial sub-sector are likely to have on the survival and progress of the mass of small-scale fishing households. Also, since administrative regulation of entry into the fishery activity is not always feasible for countries with limited control over individual economic activities, devising means to influence the sector require a good knowledge of its workings.

The population policy perspective suggests similar concerns as programmes need to be adapted to the socio-economic context of target populations and take into account the role of demographic patterns in long-term family strategies. Likewise, population policies which aim to balance human population dynamics and demographic trends with aquatic resources and environment should adequately take into account the special natural, economic, social and cultural context of fishing communities. It should be noted in this respect that fishing communities sometimes are composed of members of specific ethnic groups or castes, warranting *a fortiori* specially designed programmes.

The overall approach should be to integrate population, health and welfare programmes with fisheries development and management actions, in order to enhance the effectiveness of policies, improve the standards of living of fishing communities and ensure a sustainable, economically beneficial and environmentally sound exploitation of the fisheries sector. In this perspective, population policy implementation in fishing countries would benefit from specific efforts aiming at making related programmes more responsive to the needs of this key population group.

The formulation of both fisheries and population policies requires reliable statistics on fisherfolk. The first step should be to gather basic information on the demographic and socio-economic characteristics of fishing communities (family size, growth rate, migration patterns, sources of employment and income, incidence of poverty etc.), with adequate attention to gender-based specificities. Securing the needed information is feasible, starting from unexploited household data present in population censuses or household budget surveys and completing them with case studies investigating the structure of the fisheries sector.

[39] At the global level, the three sub-sectors all contribute significantly to the production of the sector.

Fisherfolk of the Central Visayas Region of the Philippines

Fisherfolk in Iloilo Province of the Central Visayas Region of the Philippines

ANNEX 1

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ANNEX 2

Questionnaires

Population and Development Dynamics in Rural Communities

ANNEX 2

(FPA/INT/287/INT)

Head of household questionnaire

Identification of the household

District:.....	District ID number ☐
Tana:.....	Tana ID number ☐☐
Union:.....	Union ID number ☐☐
Village:	Village ID number ☐☐☐
Country:	Household ID number ☐☐

Interviewer visits

First visit (1)	Second visit (2)	Third visit (3)
Name interviewer:	Name interviewer:	Name interviewer:
.....	.....	.....
Day ☐☐	Day ☐☐	Day ☐☐
Month ☐☐	Month ☐☐	Month ☐☐
Result * ☐	*Result* ☐	*Result* * ☐

* *Codes for interview result:*

1. Completed
2. Household present, but no eligible respondent at home
3. Household absent
4. Questionnaire incomplete
5. Refused
6. Dwelling not found
7. Dwelling vacant/address not a dwelling/destroyed
8. Other

Total number of visits ☐

Interviewer and coders:

In case explicit coding instructions for "answer refused", "don't know" or "not-stated" in the questionnaire are lacking, you must use the following coding convention:

a. Answer refused=7, 97, 997, etc.
b. Does not know answer= 8,98 or 998, etc,
c. Answer not stated=9, 99 or 999, etc.

Summary data of household (Module A):

Person number of respondent of household questionnaire ☐☐

Number of persons in household ☐☐

Count of nuclear families in household (See A6) ☐☐

Count of ELIGIBLE MALES (15-64) in household (Count A13a) ☐☐

Count of ELIGIBLE FEMALES (15-49) in household (Count A13b) ☐☐

	Name:	Day:	Month:	Year:
Field edited by:	.....	on: ..... /	..... /	.....
Office edited by:	.....	on: ..... /	..... /	.....
Computer data-entry by:	.....	on: ..... /	..... /	.....

Module A: Household roster ((acting) head of household)

Interviewer:

The questions A1-A13 must be completed for all members of the household that are now present in the household, including:

1 Currently absent household members (e.g. children!) who went to live in an institution for an expected stay not more than one year;
2 Maids and servants who usually eat, live and sleep here; Currently absent household members who are temporarily working away from the home, but who are expected to return within 6 months

but exclude:

1 Temporary visitors
2 Friends

Enter "X" in box → ☐ to indicate that you have checked the above.

Pers. num.	A1 Could you give me the NAMES of all persons who usually live in this household. Start with the name of the head of the household — NAMES	A2 What is the relationship (*) of (NAME) to the head of the household	A3 Is (NAME male or female? 1 = Male 2 = Female	A4 Does (NAME) usually live here in the household? 1 = Yes 2 = No	A5 Did (NAME) sleep here last night? 1 = Yes 2 = No
01	.....	01	☐	☐	☐
02	.....	☐☐	☐	☐	☐
03	.....	☐☐	☐	☐	☐
04	.....	☐☐	☐	☐	☐
05	.....	☐☐	☐	☐	☐
06	.....	☐☐	☐	☐	☐
07	.....	☐☐	☐	☐	☐
08	.....	☐☐	☐	☐	☐
09	.....	☐☐	☐	☐	☐
10	.....	☐☐	☐	☐	☐
11	.....	☐☐	☐	☐	☐
12	.....	☐☐	☐	☐	☐
13	.....	☐☐	☐	☐	☐
14	.....	☐☐	☐	☐	☐
15	.....	☐☐	☐	☐	☐

(*) A2 codes: Relationship of (Names) to Head of Household.

1. Head of household (HOH)
2. Wife or Husband
3. Child (own, foster, adopted, step)
4. Grand-child
5. Daughter/Son in-law
6. Own sister/brother
7. Sister-in-law or Brother-in-law
8. Parent
9. Parent-in-law
10. Other relative
11. Other non-relative

(*) A6 code: **Interviewer,**

Persons belonging to the same nuclear family have the same Family Rank Number. E.g. a son who is married and lives with his nuclear family in the household of his father gets a different rank number than his father.

Page 3

Module A: Household roster ((acting) head of household)

Pers. Num.	A6 Interviewer: *If (Name) belongs to a nuclear family, register here the FAMILY RANK NUMBER(*) e.g. 1, 2,..etc..*	A7 What is the age of (NAME)? Interviewer: *enter '95' if person is 95 or older*	A8 What is the date of birth of (NAME)? Year	A8 Month	Only for persons of age 6-64 A9 Has (NAME) ever attended school? 1 = Yes 2 = No, Go to A11	Only for persons of age 6-64 A10 What is the highest level of school attended (*) by (NAME)? A10a level	Only for persons of age 6-64 A10 + What is the total number of years of schooling successfully completed? A10b years
01			19				
			19				
03			19				
04			19				
05			19				
06			19				
07			19				
08			19				
09			19				
10			19				
11			19				
12			19				
13			19				
14			19				
15			19				

(*) codes for A10 : levels of schooling

1. Elementary/Primary school level
2. Secondary school level
3. Vocational or Technical school level
4. College or University level

Module A: Household roster ((acting) head of household)

Pers. No.	Only for persons of age 6 - 64		A13 Interviewer: Place a circle around the person numbers of household members that are eligible for a personal interview	
	A11 What kind of work (*) does (NAME) do most of the time?	A12 What is the current marital status of (NAME)? 1. Never married 2. Married 3. Widowed 4. Divorced 5. Separated	A13a ELIGIBLE MALE *If married and age 15 or older, but below age 65.* (married,15-64)	A13b ELIGIBLE FEMALE *If married and age 15 or older, but below age 50* (married,15-49)
01	☐☐	☐	01	01
02	☐☐	☐	02	02
03	☐☐	☐	03	03
04	☐☐	☐	04	04
05	☐☐	☐	05	05
06	☐☐	☐	06	06
07	☐☐	☐	07	07
08	☐☐	☐	08	08
09	☐☐	☐	09	09
10	☐☐	☐	10	10
11	☐☐	☐	11	11
12	☐☐	☐	12	12
13	☐☐	☐	13	13
14	☐☐	☐	14	14
15	☐☐	☐	15	15
			..... Males	..... Females

Count number of ELIGIBLE males and females and enter the counts on coverpage →

Codes for A11:

1. Processing/Marketing of fish
2. Agriculture
3. Vegetable gardening/horticulture
4. Cattle raising/herding
5. Retail business/small scale family enterprise
6. Wage and salaried employment
7. Capture/culture of aquatic organisms and related activities.
8. Domestic work in combination with any activity listed under 1-7.
9. Domestic work only
10 Other

End of module A, go to module B

Module B: Living quarters and facilities in the house ((acting) head of household)

B1 Let us look at the house your household lives in, and see what the main building materials are that have been used for the construction of the roof, walls, floor.

	Bricks	Cement	Clay	Wood	Leaves	Iron/tin	Sand	Other	
a. Roof	1	2	3	4	5	6	-	8	B1a ☐
b. Walls	1	2	3	4	5	6	-	8	B1b ☐
c. Floor	1	2	3	4	5	6	7	8	B1c ☐

B2 Is the dwelling owned, rented, or lived in free?

1. Owned
2. Rented
3. Lived in free (not owned, but no rent being paid)
4. Other: specify,.....

B2 ☐

B3 What is the main source of drinking water for members of your household?

1. Piped into residence/yard/plot
2. Private well/tube welll in residence/yard/plot
3. Public tap or well
4. Spring/River/Stream/Pond/Lake
5. Private water tank
6. Other: specify, ...

B3 ☐☐

B4 How many minutes does it take to go there, get drinking water, and come back?
Interviewer: *enter 96, if drinking water is available on the premise.*

B4 ☐☐

B5 How many rooms do you have in your dwelling (compound, apartment) which are for the exclusive use of your household?
Number of rooms: ⟶

B5 ☐☐

B6 Does your household own any buildings or rooms that are rented out?

B6 ☐

1. Yes ⟶ B6a
2. No

During the past year, about how much was earned by renting out buildings or rooms?
Amount in national currency, for a 12 months period: ⟶

B6a ☐☐☐☐☐☐☐☐

B7 What type of toilet is used in this household?

1. Own flush toilet
2. Shared or public flush toilet
3. Own traditional pit toilet/latrine
4. Shared or public traditional pit toilet/latrine
5. No toilet facility, nearby bush/field is used
6. Other: specify,.....

B7 ☐☐

B8 What type of fuel does your household mainly use for cooking?

1. Wood
2. Cow/animal dung cakes
3. Coal/Charcoal/Coke/Lignite
4. Kerosene
5. Electricity
6. LPG (Liquid Petroleum Gas)/Methan
7. Other: specify,.....

B8 ☐☐

End of module B, go to module C

Module C: General, income, savings & debt situation of the household ((acting) head of household)

General:

C1. What is the main religion practiced in this household?

1. Muslim
2. Hindu
3. Christian
4. Buddhist
5. Other: specify:.....
6. No religion practiced

C1 ☐

C2. Do all persons in the household practice the same religion?

1. Yes
2. No

C2 ☐

C3. Does the head of the household belong to a tribe or ethnic group? C3 ☐

1. Yes → C3a. What is the name of the tribe? Name:.....
2. No

(office) C3a ☐☐

C4. Does the head of the household belong to a caste? C4 ☐

1. Yes → C4a. What is the name of the caste? Name:.....
2. No

(office) C4a ☐

Household income:

Interviewer: *As you know, posing questions to respondents on income is a sensitive activity. Mention to the respondent that the income information provided by him/her will be kept strictly confidential and shall only be used to give researchers insight in well-fare levels in rural communities . The insight is used to develop appropriate development projects in rural areas.*

C5. Regarding satisfying all basic needs (food, clothes, goods, services) for the household, would you rate the financial situation of the household as,

1. More than sufficient
2. Sufficient
3. Barely sufficient
4. Insufficient

C5 ☐

C6. If you compare the financial situation of this household to other households in your neighbourhood would you say that your household is;

1. Better off
2. About the same
3. Worse off

C6 ☐

C7. Please, specify from which sources you and your household members earned an income and tell me how much was earned from each source.

Income source	*Amount in national currency over 12 month period*
a. Catching fish (and selling catch after landing)	a.
b Operation of fish ponds	b
c. Renting out fish ponds to others	c.
d. Renting out fishing boats/engines/gear to others	d.
e. Processing of Fish, e.g. smoking,frying	e.
f. Marketing of fish, e.g. fish monger	f.
g. Farming of crops and selling the harvest to others	g.
h Buying crops from farmers and selling to others for profit	h.
i. Herding and raising cattle (livestock)	i.
j. Income from homestead (e.g. vegetable gardening)	j.
k. Buying and selling cattle	k.
l. Raising/selling poultry, goose, sheep, pigs and other small farm animals	l.
m. Income from business other than fishing/farming/forestry	m
n. Income from wage labour (all types)	n.
o. Income from salaried employment (service sector)	o.
p. Income from doing domestic work for others	p.
q. Income from remittances from relatives/friends/family members (incl. foreign)	q.
r. Income from lending money to others	r.
s. Income from savings (bank, insurance)	s.
t. Income from pension	t.
u. Other sources not listed above	u.

C8 Now, could you give me an estimate of the total household income earned in the past 12 months by all household member taken together?
Amount in national currency is: →

C8

Savings:

C9 Do you or members of your household save money? — C9 ☐

1. Yes → C9a
2. No → Go to C10

C9a How often do you save money? — C9a ☐

1. Daily
2. Weekly
3. Monthly
4. Yearly
5. Don't know exactly

C9b For what purpose do the members of your household save money?

Interviewer: *1=yes, 2=no, 8=does not know.*

a. Buying new household goods	C9ba ☐
b. Replacement of old household goods in future	C9bb ☐
c. Buying new goods/equipment for fishing, farming or other business	C9bc ☐
d. Replacement of old goods/equipment for fishing, farming, or other business	C9bd ☐
e. business in future	C9be ☐
f. Dowry or bride price for marriage of daughter/son	C9bf ☐
g. Education of children,,	C9bg ☐
h. Social security or income for later when old	C9bh ☐
i. To earn interest/accumulate capital	C9bi ☐
j. Other, specify:.....	C9bj ☐

C9c Where does your household save money?

Interviewer: *1=yes, 2=no, 8=does not know/not applicable*

a. Banking institutions (firm)	C9ca ☐
b. Cooperation (Co-op)	C9cb ☐
c. Post office	C9cc ☐
d. At home	C9cd ☐
e. With a trustworthy fellow-villager/friend	C9ce ☐
f. With family member who lives elsewhere	C9cf ☐
g. Other, specify:.....	C9cg ☐

C9d What has been the approximate amount of money that your household saved over the last 12 months? — C9d

Amount in national currency is: → ☐☐☐☐☐☐☐☐☐

Borrowing:

C10 Have you or the members of your household borrowed money in the past 12 months? C10 ☐

1. Yes →
2. No

End of Module C, go to Module D.

C10a What were the three main reasons for which you and/or your household borrowed money?

Interviewer:
Ask for the three most important reasons. List the most important one first (C10a1). Use code 88 if "not applicable".

1.	Buying new consumer goods	C10aa ☐☐
2.	Replacement of household goods in future	C10ab ☐☐
3.	Buying goods/equipment for business	C10ac ☐☐
4.	Dowry or bride price for marriage of daughter/son	
5.	Education children	
6.	To repay other loans	
7.	To meet expenses of social ceremonies and festivals	
8.	Other, specify:.....	

C10b From which sources did your household borrow money?

Interviewer:
Probe for the three most important ones and list the most important one first (i.e. C10b1), etc. Enter code 88 if not applicable.

1.	Banking institutions (firm)	C10ba ☐☐
2.	Cooperation (Co-ops)	C10bb ☐☐
3.	Post office	C10bc ☐☐
4.	Relatives/friends	
5.	With a trustworthy villager	
6.	Through a development project implemented here	
7.	Boat owner(s)	
8.	Traders/middlemen	
9.	Private money lender	
10.	Shopkeeper	
11.	Other, specify:.....	

C10c
What was the approximate total amount of money that was borrowed by the members of your household, in the last 12 months? C10c

Amount, in national currency is: → ☐☐☐☐☐☐☐☐☐

C10d
What is the approximate amount of loan that was repaid during the last 12 months? C10d

Amount, in national currency is: → ☐☐☐☐☐☐☐☐☐

End of Module C, go to Module D

Module D: Ownership and acquisition of land, animals, fishing materials ((acting) Head of Household)

D1. Does your household own any of the following?
Interviewer: *Only consider technically working items. Enter 1 if "yes", 2 if "no",*

a. electricity	D1a
b. working radio	D1b
c. working television	D1c
d. working refrigerator	D1d
e. working watch	D1e
f. working tractor	D1f
g. working bullock cart	D1g
h. working water pump	D1h
i. working car	D1i
j. working bicycle	D1j
k. sofa set	D1k
l. working sewing machine	D1l
m telephone	D1m

D2. Does your household have any land in use? D2

1. Yes → D2a.
2. No

D2a. How much land does the household have in use, in acres?
Interviewer: *Also enter a decimal value, if applicable.*
Amount in acres is: → D2a acres

D2b. On average, during the last year, how much of the the total acreage was used for: acres

a. Agriculture	D2ba
b. Cattle raising/herding	D2bb
c. Forestry	D2bc
d. Fish farming	D2bd
e. Fallow	D2be
f. Other	D2bf

Go to D10

D3. Is the land owned, rented/leased or has it been obtained free of charge? D3

1. Owned, through inheritance → **Go to D4**
2. Owned, bought with accumulated household capital
3. Rented/leased from village/community administration → **Go to D5**
4. Rented/leased from another household/person
5. Allocated for free by village/community administration → **Go to D6**
6. Allocated for free by another household/person → **Go to D6**
7. Mixture of the above categories → **Go to D4**

D4. Who in the household has inherited land? D4a D4b D4c
Interviewer: 1. *In D4a-D4c, enter a person number of the household member (see module A). Only register a maximum of three persons. He/she who inherited most is entered in D4a. Enter code 88, if not applicable.*
2. *After completion of this question:* **Go to D6**

D5 If the land was bought, rented or leased how did the household pay?

1. With a loan/credit from a bank
2. With a loan/credit from a private money-lender
3. With a loan/credit from relatives not living in this house
4. With accumulated capital/savings from household members
5. With a loan/credit obtained through a local development project
6. Through exchange of goods or provision of certain services
7. Other: specify,.....

D5 ☐☐

D6 Which women in this household own, rented or leased land?

Interviewer: *In D6a-D6c, enter a person number of the household member (see module A). Only register a maximum of three women. The woman who owns, rents and/or leases most is entered in D4a. Enter code 88, if not applicable.*

D6a ☐☐
D6b ☐☐
D6c ☐☐

D7 What is the size of the non-irrigated land of this household under cultivation, in acres? ⟶

Interviewer: *Also enter a decimal value, if applicable.*

acres
D7 ☐☐☐☐.☐

D8 What is the size of the irrigated land of this household under cultivation, in acres ⟶

Interviewer: *Also enter a decimal value, if applicable.*

acres
D8 ☐☐☐☐.☐

D9. During the last 12 months, which major crops where grown and harvested on the land of this household? Also indicate what the destination of the harvest was.

Interviewer: *Enter a value in each of the boxes below: 1 if "yes", 2 if "no", 3 if don't know", 8 if "not applicable".*

	D9a household consumption	D9b for selling on market	D9c Other
a. Rice	☐	☐	☐
b. Wheat	☐	☐	☐
c. Maize	☐	☐	☐
d. Cassava	☐	☐	☐
e. Nuts	☐	☐	☐
f. Vegetables/fruits	☐	☐	☐
g. Coffee	☐	☐	☐
h. Tea	☐	☐	☐
i. Cotton	☐	☐	☐
j. Jute	☐	☐	☐
k. potatoes	☐	☐	☐
l. sugar cane	☐	☐	☐
m. Other, specify:.....	☐	☐	☐

D10 Does this household own animals? D10 ☐

1. Yes ⟶
2. No

Go to D12

D10a. How many of the following animals does the household have?

a. Cows	☐☐	h. Buffaloes	☐☐
b. Goats	☐☐	i. Pigs	☐☐
c. Sheep	☐☐	j. Fish (e.g. fishpond area in square meters)	☐☐
d. Poultry	☐☐		
e. Bees (i.e. beehives)	☐☐	k. Oxen	☐☐
f. Horses	☐☐	l. Rabbits	☐☐
g. Donkeys	☐☐	m Camels	☐☐
		n. Other, specify:.....	☐☐

D11 Do women in the household own any of the animals that I read out to you in the previous question? — D11

1. Yes → D11a
2. No

D11a
Which women in the household own such animals?
Interviewer: *Enter the person numbers of women in the household (see module A) who own animals. If more than 4 women, only register those who have most. The woman with animals worth most is ranked first in D11aa. Write code 88 if not applicable.*

D11aa
D11ab
D11ac
D11ad

D12 Just to make sure that I have understood you right: Are you or any of your household members directly or indirectly linked to the fisheries, that is, in the catching, processing and/or marketing of fish? — D12

Interviewer: *Persons are DIRECTLY linked to the fisheries if they actually are fishing, processing or marketing fish. Persons are INDIRECTLY linked to the fisheries if they, for instance, have boats or gear, but only rent out the equipment and do not actually engage in the catching, processing and marketing of fish.*

1. Yes → **Go to D13**
2. No → **Go to module E: Environment**

D13 Do you or your household members own boats that are used for fishing? — D13

1. Yes → D13a
2. Yes, shared → D13a
3. No → **Go to D14**

D13a
How many boats are owned by the household and how many are rented or leased from others?

Boats owned/shared → D13aa
Boats rented/leased from others → D13ab

D13b
Does your household hire out boat(s) sometimes? — D13b

1. Yes
2. No → **Go to D13e**

D13c
For how much per day does the household hire out boats? — D13c
Amount in national currency is:

D13d
During the past 12 months, how much has the household received by hiring out the boat(s)?
Interviewer: *Interviewer, if the respondent finds it difficult to recall the amount, try to make him/her estimate what the amount is per month or per week.* — D13da
Amount in national currency is:
Reference period: 1=12 months, 2= month, 3= per week — D13db

D13e What was the most important source to pay for the boat(s)? D13e

1. loan/credit from a bank
2. loan/credit from a private money-lender
3. loan/credit from a fish trader
4. loan/credit from relatives not living in this house
5. cash savings from household members
6. loan/credit from a local development project
7. exchange of goods or provision of certain services
8. Other: specify,.....

D13f Who is mainly responsible for maintenance of the boat(s)? D13f

1. Self or other household members
2. Relatives outside the household
3. Dealer
4. Mechanic
5. Other

D13g Please give the following information for each boat that your household has.
Interviewer: *Interviewer, if respondent has more than 6 boats only list the first 6 boats. Rank the boat worth most as the first one, (=highest replacement costs) in the table below.*

Boat	D13ga Type(*)	D13gb Age (years)	D13gc Replacement Costs	D13gd Maintenance Costs (per year)	D13ge Weight in tons	D13gf Length in meters
1.						
2.						
3.						
4.						
5.						
6.						

(*) 1. Log raft/Kattumaram
2. Outrigger boat
3. Dugout canoe
4. Planked canoe/displacement craft WITHOUT inboard engine
5. Planked canoe/displacement craft WITH inboard engine
6. Purse seiner
7. Trawler
8 Other types

D14 Do you or your household members own engines for fishing boats (outboard and/or inboard)? D14

1. Yes → D14a
2. Yes, shared → How many engines are owned by the household and how many are rented or leased from others
3. No

Engines owned/shared → D14aa
Engines rented/leased from others → D14bb

D15 Do you or your household members own fishing gear, that is, fishing nets or fishing lines?

1. Yes → D15a
2. Yes, shared → D15a
3. No

D15 ☐

D15a How many fishing gear are owned by the household and how many are rented or leased from others?

Gear owned/shared → D15aa ☐☐

Gear rented/leased from others → D15ab ☐☐

Go to D16.

D15b Now we would like to have the following information for each fishing gear that your household owns or rented.

Interviewer: *If respondent has more than 6 fishing gear only list the first 6 fishing gear. Rank the fishing gear worth most, first, (=highest replacement costs) in the table below.*

Fishing gear	D15ba Type(*)	D15bb Age (years)	D15bc Replacement Costs	D15bd Maintenance Costs (per year)
1.	☐☐	☐☐	☐☐☐☐☐☐☐	☐☐☐☐☐☐
2.	☐☐	☐☐	☐☐☐☐☐☐☐	☐☐☐☐☐☐
3.	☐☐	☐☐	☐☐☐☐☐☐☐	☐☐☐☐☐☐
4.	☐☐	☐☐	☐☐☐☐☐☐☐	☐☐☐☐☐☐
5.	☐☐	☐☐	☐☐☐☐☐☐☐	☐☐☐☐☐☐
6.	☐☐	☐☐	☐☐☐☐☐☐☐	☐☐☐☐☐☐

(*) 1. Gillnet 2. Beach seine 3. Purse seine 4. Scoopnet 5. Liftnet 6. Bottom long-line 7. Pelagic long-line 8. Hand-line 9. Fixed net/barrier 10. Trolling line 11. Trawl net 12. Other gear

D16. Does the household operate fish ponds?

D16 ☐

1. Yes → D16a. What is the total area of the fish ponds in square meters?
   Area in square meters? → D16a ☐☐☐☐☐☐
2. No

D16b. How much of the total area of fish ponds is owned by the household and how much is leased?

Area in square meters that is OWNED: → D16ba ☐☐☐☐☐☐

Area in square meters that is LEASED: → D16bb ☐☐☐☐☐☐

End of Module D, go to Module E.

E1 I would like to have your opinion about the quality of the environment in this village/community. How satisfied or dissatisfied are you with the quality of some characteristics of this community/village?

Interviewer:

Try to make the respondent choose between "satisfied" and "dissatisfied" and avoid the easy way out by using the categories 3 and 4. If a characteristic is not present at all in this community/village then enter code 8.

	Satisfactory	Not satisfactory	Neither satisfied, nor dissatisfied	Don't know	
a. Agricultural land	1	2	3	4	E1a
b. Pastures	1	2	3	4	E1b
c. Forests	1	2	3	4	E1c
d. Coastal environment	1	2	3	4	E1d
e. Fish stocks/grounds	1	2	3	4	E1e
f. Transport system	1	2	3	4	E1f
g. Drinking water	1	2	3	4	E1g
h. Lake,river, sea water	1	2	3	4	E1h

E2 Now, please try to think back to the situation about 10 years ago. Would you say that the quality of the characteristics we just talked about have become better or worse?

Interviewer:

Only make use of "about the same" and "don't know" categories if you do not succeed to make the respondent choose between better" and worse". Enter code 8 if characteristic is not present here.

	Better	About the same	Worse	Don't know	
a. Agricultural land	1	2	3	4	E2a
b. Pastures	1	2	3	4	E2b
c. Forests	1	2	3	4	E2c
d. Coastal environment	1	2	3	4	E2d
e. Fish stocks/grounds	1	2	3	4	E2e
f. Transport system	1	2	3	4	E2f
g. Access to news	1	2	3	4	E2g
h. Drinking water	1	2	3	4	E2h
i. Lake,river, sea water	1	2	3	4	E2i

***** End of Household Questionnaire *******

Interviewer:

Continue with the individual-level questionnaire for the head of household and, subsequently, interview all eligible persons. Eligible men in this household are all men of age 15 and older, but not older than 60 years. Eligible women are all women in the household that are age 15 or older, but not older than 49 years. (Please refer to the encircled person numbers in A13, in Module A)

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MALE individual questionnaire

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(Married males of age 15 or older but not older than 64 years (15-64))

Country: Bangladesh

District:.....	District ID number ☐
Tana:.....	Tana ID number ☐☐
Union:.....	Union ID number ☐☐
Village:.....	Village ID number ☐☐☐
	Household ID number ☐☐
Name of male respondent:.....	Person number of male respondent ☐☐
Name of first wife:.....	Person number of (first) wife ☐☐
Name of second wife:.....	Person number of (second) wife ☐☐
Name of third wife:.....	Person number of (third) wife ☐☐

Interviewer visits

First visit (1)	Second visit (2)	Third visit (3)
Name interviewer:	Name interviewer:	Name interviewer: .....
Day ☐☐	Day ☐☐	Day ☐☐
Month ☐☐	Month ☐☐	Month ☐☐
Result * ☐	***Result **** ☐	***Result **** ☐

* ***Interview result code:***

Total number of visits ☐

1. Completed
2. Not at home
3. Postponed
4. Refused
5. Partly completed
6. Other, specify: .....

Interviewer and coders:

In case explicit coding instructions for "answer refused", "don't know" or "not-stated" in the questionnaire are lacking, you must use the following coding convention:

a. Answer refused=7, 97, 997, etc.

b. Respondent does not know answer= 8,98 or 998, etc.

c. Answer not stated=9, 99 or 999, etc.

	Name:	Day:	Month:	Year:
Field edited by:	..... on:	..... /	..... /	.....
Office edited by:	..... on:	..... /	..... /	.....
Computer data-entry by:	..... on:	..... /	..... /	.....

Module E: Respondent's Background

E1. I would like to know about the type of place you grew up when you were young. For most of the time until you were 12 years old, did you live in:
Interviewer: *Enter for each place: 1=yes or 2=no or 8=not applicable*

a. In this village	E1a	☐
b. In this tana	E1b	☐
c. In this district	E1c	☐
d. Elsewhere	E1d	☐

E2. In what month and year were you born? Year → E2y 19☐☐
Month → E2m ☐☐

E2a. **Interviewer:** what is the sex of this respondent? (1=male, 2= female) → E2a ☐

E3. How old were you on your last birthday? E3 ☐☐
Interviewer:
1. *Record the age in completed years, compare with A7 in household questionnaire (Module A) and discuss difference with respondent, if any, and make adjustments, if applicable.*
2. *Check consistency with E2, and correct E2 and/or E3, if applicable.*

E4. Have you ever attended school? E4 ☐

1. Yes
2. No → **Go to E7**

E5. What is the highest level of school you attended? E5 ☐

1. Preschool level → **Go to E7**
2. Elementary/ Primary school level → **Go to E7**
3. Secondary school level
4. Vocational or technical school level
5. College/University level

E6. What is the total number of years of schooling that you have completed successfully level? → **Go to E8** E6 ☐☐

E7. Can you read and understand a letter or newspaper article easily, with difficulty, or not at all? E7 ☐

1. Easily
2. With difficulty
3. Not at all → **Go to E9**

E8. Do you usually read a newspaper or magazine at least once a week? E8 ☐

1. Yes
2. No

E9. Do you listen to the radio at least once a week? E9 ☐

1. Yes
2. No

E10. Do you watch television at least once a week? E10 ☐

1. Yes
2. No

E11 What is your religion? E11 ☐☐

1. Muslim
2. Christian
3. Hindu
4. Buddhist
5. Other, specify:.....
6. Person states not to have a religion

E12 What was the highest level of school your father attended?

1. Did not attend school → E12a.
2. Elementary/ Primary school → Can your father read and can he write?
3. Secondary school
4. Vocational or technical school
5. College or University
8. I don't know

1. Yes, both read and write
2. Yes, only reading
3. No
8. I don't know

E12 ☐

E12a ☐

E13. When you grew up, what kind of work was your father mainly doing? E13 ☐☐

1. Fish catching with boats in open sea or on the lake
2. Fish catching along shores (e.g. with beach seines)
3. Fish farming
4. Fish marketing
5. Fish processing
6. Boat building
7. Farming/Agriculture on permanent plots
8. Farming/Agriculture, shifting cultivation
9. Cattle herding
10. Horticulture
11. Retailing
12. Military
13. Service sector employed
14. Housekeeping/domestic work
15. Cottage industry
16. Handicraft
17. Parent died when respondent was young/Respondent does not know father.
18. Other, specify:.....

E14. Did your father receive a pay or salary for that work? E14 ☐

1. Yes
2. No
8. Don't know

E15. What was the highest level of school your mother attended? E15 ☐

1. Did not attend school → E15a.
2. Elementary/ Primary school → Can your mother read and can she write?
3. Secondary/ High school
4. Vocational or Technical school
5. College or University
8. I don't know

1. Yes, both read and write
2. Yes, only reading
3. No
8. I don't know

E15a ☐

E16. When you grew up, what kind of work was your mother mainly doing? E16 ☐☐

1. Fish catching with boats in open sea or on the lake
2. Fish catching along shores (e.g. with beach seines)
3. Fish farming
4. Fish marketing
5. Fish processing
6. Boat building
7. Farming/Agriculture on permanent plots
8. Farming/Agriculture, shifting cultivation
9. Cattle herding
10. Horticulture
11. Retailing
12. Military
13. Service sector employed
14. Housekeeping/domestic work
15. Cottage industry
16. Handicraft
17. Parent died when respondent was young/Respondent does not know mother.
18. Other, specify:.....

E17. Did your mother receive a pay or salary for her work? E17 ☐

1. Yes
2. No
8. Don't know

E18. Who were the persons that mainly raised and took care of you when you were young? E18 ☐☐

1. Both parents
2. Mother only
3. Father only
4 Brother(s) or sister(s)
5. Uncle/aunt or other relatives
6. Step parents/foster parents (non-relatives)
7. Orphanage
8. Other, specify:.....

E19 Did your parents separate or divorce when you were young? E19 ☐

1. Yes → E19a How old were you when your parents separated or divorced? *Age in completed years* → E19a ☐☐
2. No

E20. Are your parents still alive? E20 ☐

1. Both parents are alive
2. Both parents died → E20a At what age did your (father and/or mother) die? *Interviewer, enter 88 if not applicable.*
3. Father alive, mother died → E20a
4. Father died, mother alive → E20a

Father's age at death → E20aa ☐☐
Mother's age at death → E20ab ☐☐

End of Module E, go to Module F

Module F: Work/Occupation

Interviewer: Please read out the following to the respondent:

...We would like to ask you something about your work/occupation history, that is, about any work that is beneficial to you and/or other members in the household ....."

F1 Do you have work/an occupation?

Interviewer:
1. *Discount temporary leaves such as holiday, illness, parental leave, labour dispute, etc.*
2. *If answer is 'no', try to find out if respondent works in a family business or farm and, if so, change 'no' into 'yes'.*

1. Yes
2. No → **End of Module F, go to Module G**

F1 ☐

F2 What is the main type of work/occupation that you do? F2 ☐☐

1. Fish catching with boats in open sea or on the lake/river
2. Fish catching along shores (e.g. with beach seines)
3. Fish farming
4. Fish marketing
5. Fish processing
6. Boat building/construction
7. Farming/Agriculture on permanent plots
8. Farming/Agriculture, shifting cultivation
9. Cattle raising/cattle herding
10. Horticulture or vegetable gardening
11. Retailing or other small scale business
12. Military
13. Service sector employee
14. Housekeeping, domestic work
15 Cottage industry
16. Handicraft
17. Other, specify :.....

F3 Do think the type of work/occupation you are doing is a financial beneficial one? F3 ☐

1. Yes → F3a Why is this a financial beneficial type of work/occupation as compared to other type of work?
   Give reason:.....
   .....
   .....
   (office) F3a ☐☐

   F3b Do you think this work/occupation is a promising one for you in the future?
   1. *Yes, give reason:*.....
      .....
   2. *No, give reason:*.....
      .....
   (office) F3b ☐☐

   ▽ **Go to F4**

2. No → F3c Why is this NOT a financial beneficial type of work as compared to other type of work/occupation?
   Give reason:.....
   .....
   .....
   (office) F3c ☐☐

   ▽ **Go to F4**

F4 If you have, or would have a son, would you advise him to do the same work/occupation as you are doing?

1. Yes, because.....
.....
2. No, because.....
.....

(office) F4 ☐☐

F5 If you have, or would have a daughter, would you advise her to do the same work/occupation as you are doing?

1. Yes, because.....
.....
2. No, because.....
.....

(office) F5 ☐☐

F6 How old were you when you started working in your current and main work/occupation?

Interviewer: *If respondent cannot remember, try asking "how many years ago did you start in your current work/job?", and subsequently calculate the age using the information given in E3.*

Age was: ⟶ F6 ☐☐

F7 How many hours do you normally work per week in your main work/occupation.

Number of hours: ⟶ F7 ☐☐☐

Interviewer: *If answer cannot be given per week, try to find out "on average per day in a normal week'" and compute the number of hours per week from that.*

F8 Besides your main work/occupation do you have a subsidiary/additional one? F8 ☐

1. Yes
2. No ⟶ **Go to Module G**

F9 What is your subsidiary work/occupation? F9 ☐☐

1. Fish catching with boats in open sea or on the lake/river
2. Fish catching along shores (e.g. with beach seines)
3. Fish farming
4. Fish marketing
5. Fish processing
6. Boat building/construction
7. Farming/Agriculture on permanent plots
8. Farming/Agriculture, shifting cultivation
9. Cattle raising/cattle herding
10. Horticulture or vegetable gardening
11. Retailing or other small scale business
12. Military
13. Service sector employee
14. Housekeeping, domestic work
15. Cottage industry
16. Handicraft
17. Other, specify :.....

F10 How many hours do you normally work per week in your subsidiary work/occupation?

Number of hours: ⟶ F10 ☐☐☐

Interviewer: *If answer cannot be given per week, try to find out "on average per day in a normal week'" and compute the number of hours per week from that.*

End of Module F, go to Module G

Interviewer: *Module G contains questions for both men and women. In several places in the text below "husband and wife" is represented by "partner". Explain to the respondent that you will use the concept of "partner" to avoid mentioning "husband or wife" all the time.*

G1 Have you ever been married or did you ever live together with a man/woman? G1 ☐

1. Yes → G1a What is your marital status? G1a ☐
2. No

1. Married
2. Living together
3. Widowed → **Go to G4**
4. Divorced/separated → **Go to G4**

Go to G5a

Interviewer: *If respondent is FEMALE ask questions G2, G2a, G2b, G2c, if applicable. If respondent is MALE go to G3.*

G2 Does your husband/partner have other wives/partners besides yourself? G2 ☐

1. Yes → G2a How many other wives/partners does he have?
2. No

Number of wives/partners → G2a ☐☐

G2b Are you his first, second, third, etc. wife/partner?
Ranking number of wife/partner → G2b ☐☐

G2c How old is the oldest wife/partner and how old is the youngest wife/partner?
Age of oldest wife → G2ca ☐☐
Age of youngest wife → G2cb ☐☐

Go to G4 **Go to G4**

G3 Do you have more than one wife/partner with whom you have a durable relationship? G3 ☐

1. Yes → G3a How many other wives/partners do you have?
2. No

Number of wives/partners → G3a ☐☐

G3b How old is the oldest and how old is the youngest wife/partner?
Age of oldest wife/partner → G3ba ☐☐
Age of youngest wife/partner → G3bb ☐☐

G4 Have you been married or living together with a partner only once or more than once? G4 ☐

1. Only once → **Go to G4b**
2. More than once → G4a How many times have you been married or lived together with a partner?

Number of times → G4a ☐☐

G4b
At what age did you marry or did you start living together with your (first) partner?
Age ——→ G4b

Interviewer, look at reply G1a:
Respondent currently married → **Go to G4c**
Respondent NOT currently married → **Go to G5a**

G4c
Did you live together with your (first) partner before you got married?
1. Yes
2. No → **Go to G5a** G4c

G4d
At what age, before your marriage, did you start living together with your (first) husband/partner?
Age ——→ G4d

G4e
How old was your (first) husband/partner when you started living with him/her?
Age ——→ G4e

G5a In your opinion, what is an appropriate age for a WOMAN to marry or start living together with a partner? *Age for a woman* ——→ G5a

G5b Some WOMEN marry at even younger ages. What do you think would be the main reason for doing so? **Interviewer:** *Repeat, if necessary, reply on G5a.* (office)
Main reason is: G5b
.....

G5c What is an appropriate age for a MAN to marry or start living together with a partner? *Age for a man* ——→ G5c

G5d Some MEN marry at even younger ages. What do you think would be a main reason for doing so? **Interviewer:** *Repeat, if necessary, reply on G5c.* (office)
Main reason is: G5d
.....

G6 Now I would like to read out to you a few statements. I would like to know whether you "agree" or "disagree".

Interviewer:

1. *Some of the following questions could arouse a respondent. If you sense that the respondent is aroused please explain that the way questions have been formulated, including their topic, have a scientific purpose and are certainly 'not meant to arouse respondents or show lack of respect!*

2. Read out the statements below, one by one, and ask the respondent whether she or he "agrees" or "disagrees" with the content of the statement. Enter in the column on the right hand side a value associated with the answer of the respondent, that is:
   1=agree
   2=disagree
   3=don't know ⟶ *Avoid as much as possible the answer category don't know" (3). Try, though, without pressing, to make the respondent choose between "agree" "do not agree". In case the respondent refuses an answer use code 7.*

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a. Marrying at a young age, say before age 16, is good for a woman.	G6a	☐
b. It is financially attractive to marry at a young age.	G6b	☐
c. Quite a few persons who marry or start living together with a partner at a young age do so to escape from parental control.	G6c	☐
d. It is healthier to have the first baby at a young age.	G6d	☐
e. A man will not easily marry a widow who has children with another man.	G6e	☐
f. In general, it is not difficult for a woman who is single/unmarried to combine working for a living and raising, say two children.	G6f	☐
g. A man will not easily marry a divorced woman who has children from another man.	G6g	☐
h. Seeking a good husband for marriage is more important for a young woman than seeking good education.	G6h	☐
i. If I have a son, he will need my permission to marry someone.	G6i	☐
j. Although parents love all their children, most parents favour theirs sons.	G6j	☐
k. Once you are married everything in your life will really change.	G6k	☐
l. Young men have more freedom to go wherever they want than young women.	G6l	☐
m Having children while bot being married is disastrous for a woman in this community.	G6m	☐
n. In general, it is not difficult for a married woman to combine work and raise , say, two children.	G6n	☐
o. Seeking a good wife for marriage is more important for a young man than seeking good education.	G6o	☐
p. If I have a daughter, she will need my permission to marry someone.	G6p	☐
r. Marrying at a young age is good for a man.	G6r	☐

End of module G, go to module H

Module H: Fertility and fertility perceptions

Interviewer: MALE respondent → **Go to H10**
FEMALE respondent → **Go to H1**

H1 I would like to ask you about the births you had during your lifetime. Have you ever given birth to a child who was alive at the time of birth? H1 ☐
1. Yes
2. No → **Go to H7**

H2 Do you have any sons you have given birth to who usually live with you? H2 ☐
1. Yes
2. No

H2a How many sons live with you? H2a ☐☐

H3. Do you have any daughters you have given birth to who usually live with you? H3 ☐
1. Yes
2. No

H3a How many daughters live with you? H3a ☐☐

H4. Do you have any sons you have given birth to, who do not usually live with you? H4 ☐
1. Yes
2. No

H4a How many sons do not live with you? H4a ☐☐

H5 Do you have any daughters you have given birth to, who do not usually live with you? H5 ☐
1. Yes
2. No

H5a How many daughters do not live with you? H5a ☐☐

H6. Have you ever given birth to a child that later died? H6 ☐
Interviewer: *if no, ask "..any boy or girl who cried or showed any signs of life but only survived a few hours or days..?"*
1. Yes
2. No

H6a. How many boys that you have given birth to have died? H6a ☐☐
Interviewer: *if none, fill in '00'*
H6b. How many girls that you have given birth to have died? H6b ☐☐
Interviewer: *if none, fill in '00'*

H7. **Interviewer:** *Sum answers to questions H2a, H3a, H4a, H5a, H6a and H6b. Enter this sum, here, in H7. If H2a through H6b are empty, enter '00' in H7.* H7 ☐☐

H8 Just to make sure: during your life, you have had (see H7) live births in total. Is this correct? H8 ☐
1. Yes
2. No → **Interviewer:** *Probe and correct your entries in H2a through H7.*

Interviewer: *1. if respondent had one or more live births (see H7) then* → ***Go to H9***
2. if respondent did not have any live births, → ***Go to H11***

H9. Now I would like to talk about all your births, whether still alive or not.Please give me the names of all your births.
Interviewer: *first, enter all names in H9, second, check that the number of names equals the number of births entered in H7. If not verify with respondent and make concomitant changes. Then, continue with H9a, H9b, etc. for each birth.*
After completion of this sheet → **Go to H11**

Names of children born to this respondent. List name first birth, first. *(Interviewer, if a baby was not given a name because it died after birth, write NONAME 1, NONAME 2,..)*	H9a Is (name) a boy or a girl? 1. Boy 2. Girl	H9b Is (name) still alive? 1. Yes 2. No	H9c In what month and year was (name) born? Month Year	H9d Is (name) still living with you? 1. Yes 2. No	H9e Are you breastfeeding this child now? 1. Yes 2. No	H9f Is this child currently attending school? 1. Yes 2. No
1.	☐	☐	☐☐ 19☐☐	☐	☐	☐
2.	☐	☐	☐☐ 19☐☐	☐	☐	☐
3.	☐	☐	☐☐ 19☐☐	☐	☐	☐
4.	☐	☐	☐☐ 19☐☐	☐	☐	☐
5.	☐	☐	☐☐ 19☐☐	☐	☐	☐
6.	☐	☐	☐☐ 19☐☐	☐	☐	☐
7.	☐	☐	☐☐ 19☐☐	☐	☐	☐
8.	☐	☐	☐☐ 19☐☐	☐	☐	☐
9.	☐	☐	☐☐ 19☐☐	☐	☐	☐
10.	☐	☐	☐☐ 19☐☐	☐	☐	☐
11.	☐	☐	☐☐ 19☐☐	☐	☐	☐
12.	☐	☐	☐☐ 19☐☐	☐	☐	☐
13.	☐	☐	☐☐ 19☐☐	☐	☐	☐
14.	☐	☐	☐☐ 19☐☐	☐	☐	☐
15.	☐	☐	☐☐ 19☐☐	☐	☐	☐

H10 Have you become father of a child (born alive) with one or more women? — H10 ☐

1. Yes → H10a. How many times have you become father with the wive(s)/partner(s) your were with? *Number of times* → H10a ☐☐
2. No

H10b. How many women made you father? *Number of women* → H10b ☐☐

H11 If you could choose the number of children to have in your whole life, how many would that be? *Number of children* → H11 ☐☐

Interviewer: *if respondent gives another answer than a number, describe this here:* .....

.....

H11a What is the ideal number of sons to have? → H11a ☐☐

H11b What is the ideal number of daughters to have? → H11b ☐☐

Interviewer: *if respondent is MALE* → **Go to H15**
Interviewer: *if respondent is FEMALE* → **Go to H12**

H12 Are you pregnant now?

1. Yes → H12 ☐
2. No or not sure

Go to H13

H12a After the child you are expecting, do you think your husband would like you to have another child or would he prefer you not to have any more children? — H12a ☐

1. Have another
2. No more

H12b At the time you became pregnant, did you want to want to become pregnant, did you want to wait until later, or did you not intend to become pregnant at all? — H12b ☐

1. Wanted to become pregnant
2. Preferred to wait until later
3. Did not intend to become pregnant

H12c If you could choose would you prefer the child you are carrying to be a son or to be daughter? — H12c ☐

1. Son
2. Daughter
3. Either

H12d. Now I have a question about the future. After the child you are expecting, would you like to have another child or would you prefer not to have any (more) children? — H12d ☐

1. Have another child → **Go to H14**
2. No more children → **Go to H15**
3. Undecided → **Go to H14**

H13 I have a question about your last birth. Did you want to have that child then, did you want to wait until later, or did you want no more children at all?

1. Then
2. Later → H13a For what main reason did you want to wait until later?
   .....
   .....
3. Did not want children

H13 ☐

(office) H13a ☐

H14 Interviewer: *if respondent is not pregnant* → **Ask question a.**
if respondent is pregnant → **Ask question b.**

a. How long would you like to wait from now before the birth of (another) child? *Number of months and/or years* →

Months H14m ☐☐

b. After the birth of the child you are expecting, how long would you like to wait before the birth of another child? *Number of months and/or years* →

Years H14y ☐☐

H15 Some speak about families with a large or small number of children.

H15a When you think about a family with a large number of children, about how many children are you then thinking of?
Number of children →

H15a ☐☐

H15b When you think about a family with a small number of children, about how many children are you then thinking of?
Number of children →

H15b ☐☐

H15c In your opinion, what is the main reason why some couples want a large number of children?
Main reason is: ..... →
.....

(office) H15c ☐☐

H15d In your opinion, what is the main reason why some couples want a small number of children?
Main reason is: ..... →
.....

(office) H15d ☐☐

H16 Some people say that the number of available jobs, houses and educational facilities, the amount of fishery resources and land for cultivation, etc., do not depend on the number of children that families have. Do you agree or disagree with what these people say?

H16 ☐

1. Agree
2. Disagree → H16a If the number of children that families have is not the main issue, could you then mention two reasons which will affect the number of available jobs, houses, educational facilities, fish resources and land availability.
   Interviewer: *code 98 if resp. does not know*
   1. .....
   2. .....
3. Neither agree nor disagree

(office) H16aa ☐☐ H16ab ☐☐

H17 In some families, women work, while in others, they do not. Do you think a married woman with children should be able to work for pay away from home?

H17 ☐

1. Yes
2. No
3. It depends
4. Do not know

H18 Under which circumstances should a woman be able to work away from home?

Interviewer: *Do not read out the categories below, as we seek a spontaneous answer.*

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1. When family needs money
2. When husband is sick, away, or dead
3. When husband wants her to
4. When the woman chooses to do so
5. Other, specify:.....
6. Do not know

H18 ☐☐

H19 Some people talk about the changing roles of men and women in the society. Can you tell me whether you agree or disagree with each of the following statements?

Interviewer: *Use the following codes to register the answer of the respondent:*
1=agree
2=neither agree nor disagree
3=disagree

a. A mother who works away from the home can establish just as warm and secure a relationship with her children as a mother who does not work away from the home.	H19a ☐
b. Having a job is the best way for a woman to be an independent person	H19b ☐
c. Being a housewife is just as fulfilling as working for pay.	H19c ☐
d. Both the man and the woman should contribute to the household income.	H19d ☐
e. A young child, say at pre-school age, is likely to suffer if his/her mother works	H19e ☐
f. A job for a woman is alright, but what women really want is a home and children.	H19f ☐

End of module H, go to module I

Module I: Contraceptive use and perceptions

Interviewer: ***It is imperative that both female and male respondents answer the questions in this module! For example, question I2e and I3g are to be asked also to women, whereas I1a, I1f, I3f are also to asked to male respondents!***

Knowledge of contraceptive methods:

Now I would like to talk about family planning issues, that is the various methods that a couple can use to delay or avoid a pregnancy.

Interviewer: *Note that only the spontaneous recognition of the method must be registered.*

	I1 Have you ever heard of (method)? (1=yes, 2=no)	I2 Have you ever used (method)? (1=yes, 2=no)	I3 Do you know where to get the method? (1=yes, 2=no)
a. Pill			
b. IUD			
c. Injections			
d. Diaphragm,foam or jelly,cream			
e. Condom			
f. Ligation/Female steralization			
g. Vasectomy/ Male steralization			
h. Natural FP, rhythm, period abstinence			
i. Withdrawal			

I4. Have you ever heard of other methods used here in this community that I have not read out to you? Could you also say whether you have used such methods? — I4 ☐

1 Yes → I4a Please describe the (those) method(s) to me. (office)
2 No

Interviewer: *Interviewer: only register the first two spontaneously mentioned methods.*

Method 1:..... I4aa ☐
Method 2:..... I4ab ☐

I4b Have you used one of these methods? — I4b ☐

1. Yes
2. No

Interviewer, verify:
- *If not a single "yes "(1) in I2 and in I4b* → *Respondent=never user* **Go to I5**
- *If at least one "yes" (1) in I2 and in I4b* → *Respondent=ever user* **Go to I11**

Never users:

I5 Do you intend to use a contraceptive method to delay or avoid pregnancy at any time in the future? — I5 ☐

1. Yes
2. No

I6 Could you mention the main reason why you do not intend to use a contraceptive method? I6

Interviewer: *Do not read out categories but compare answer with categories below and register appropriate one.*

1. Wants Children
2. Lack of knowledge
3. Opposed to family planning
4. Costs too much
5. Side effects
6. Health concerns
7. Hard to get methods here
8. Religion
9. Fatalistic
10. Difficult to get pregnant
11. Husband often away
12. Infrequent sexual intercourse
13. Age/Menopause
14. Inconvenient
15. Not married
16. No partner to have sex with
17. Other, specify.....

I7 Do you intend to use a method to delay or avoid pregnancy within the next 12 months? I7

1. Yes
2. No

I8 If you would use a method, which method would you prefer to use? I8

1. Pill
2. IUD
3. Injections
4. Diaphragm, foam, jelly, cream
5. Condom
6. Ligation/Female sterilization
7. Vasectomy/Male sterilization
8. Natural Family Planning, rhythm method, period abstinence
9. Withdrawal
10 Other, specify:.....

I9 Do you know of a place where you can get (method mentioned in I8)? I9

1. Yes
2. No

I10 How long would it take you to travel from your home to that place?

Hours ——► I10h
Minutes ——► I10m

Interviewer, after I10, go to I25

Ever use:

I11 Which contraceptive method did you used first to avoid a pregnancy? I11

1 Pill
2 IUD
3 Injections
4 Diaphragm,foam, jelly, cream
5 Condom
6 Ligation/Female sterilization
7 Vasectomy/ Male sterilization
8 Natural FP, rhythm, periodic abstinence
9 Withdrawal
10 Other, specify.....

I12 How many children did you have at that time, if any? I12

Number of children ——►

I13 How old were you when you started to use a MODERN contraceptive method for the first time? I13

Interviewer: 1. *Modern contraceptives are those listed in I11, options 1-7.*
2. *Register the age in completed years.*

I14 When you started to use a contraceptive method for the first time, where did you go to get that method? I14 ☐☐

Government facilities:
1. Government hospital
2. MCH/FP clinic
3. Local health post

Private facilities:
4. NGO/Family Guidance Association
5. Private hospital or clinic
6. Pharmacy/Dispensary
7. Private doctor
8. Local store/shop
9. Church
10 Clinic on my work
11 Local development project
12 Friends/Relatives
13 Nowhere, I used Natural Family Planning method
14 Other, specify.....

I15 From whom or from where did you obtain information on contraceptive methods for the first time? I15 ☐☐

1. Doctor/physician
2. Nurse
3. Family planning educator
4. Parents
5. Brother/Sister
6. Friends/relatives or neighbours
7. Radio
8. Television
9. Printed materials (brochure/pamphlet/newspaper)
10. Local development project
11. School
12. Other, specify.....

I16 Are you currently doing something or using any method to delay or avoid a pregnancy? I16 ☐

1. Yes → **Go to I17**
2. No → **Go to I25**

Current users:

I17 In what year and what month did you start using that method?
Year → I17y ☐☐
Month → I17m ☐☐

I18 Which method are you using now? I18 ☐☐

1 Pill
2 IUD
3 Injections
4 Diaphragm,foam, jelly, cream
5 Condom
6 Ligation/Female sterilization
7 Vasectomy/ Male sterilization
8 Natural FP, rhythm, periodic abstinence
9 Withdrawal
10 Other, specify.....

Interviewer: Now, check I18 answer:
1. If respondent uses one of the methods 1-7, or specified another MODERN method in 10 → **go to I20**
2. If respondent uses one of the methods in 8, 9, or another Natural/traditional method in 10 → **go to I19**

I19 What type of Traditional/Natural family planning method are you using? I19 ☐☐

1. Periodic abstinence
2. Cord around waist
3. Rhythm method
4. Herbs
5. Other, specify:.....

Interviewer: ***After you completed I19, go to I25***

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I20 From where did you obtain the MODERN method that you are currently using? I20

Government facilities
1. Government hospital
2. MCH/FP clinic
3. Local health post

Private facilities
4. NGO/Family Guidance Association
5. Private hospital or clinic
6. Pharmacy/Dispensary
7. Private doctor
8. Local store/shop
9. Church
10 Clinic on my work
11. Local development project
12. Friends/Relatives
13. Other, specify.....

I21 How long does it take you to travel from your home to that place?

Hours → I21h
Minutes → I21m

I22 Is it easy or difficult to get there? I22

1. Easy
2. Difficult

I23 How did you travel to that place the last time that you went? I23

1. On foot
2. Bus
3. Taxi
4. Car
5. Bicycle
6. Other, specify:.....

I24 Are the days and opening hours of the place where you obtain your contraceptive method convenient for you? I24

1. Days and opening hours are convenient
2. Days and opening hours are not convenient
3. Days are convenient but opening hours are not convenient
4. Days are not convenient but opening hours are convenient

I25 Does your partner approve the use of MODERN family planning methods? I25
Interviewer: See I13 and I11 about what is meant with MODERN methods.

1. Yes
2. No
3. Respondent does not have partner

I26 In the relationship with your partner, how often do you discuss about family planning issues? I26

1. Yes, regularly
2. Yes, every now and then
3. Yes, but rarely/seldom
4. No, avoid talking about any family planning issue
5. No, it simply never comes to discussion about that topic
6. Respondent has no partner
7. Other, specify:.....

I27 If a couple wants to delay or avoid getting pregnant, who should be responsible for getting information about family planning methods? I27 ☐

1. Man
2. Woman
3. Both man and woman
4. It does not matter, either one
5. Other persons

I28 If a couple wants to delay or avoid getting pregnant, who should decide about the use of family planning methods? I28 ☐

1. Man
2. Woman
3. Both should have equal say
4. It does not matter, either one
5. Other persons

I29 In many places in the world women have abortions. The reasons why women resort to an abortion are many. We would like to know whether you approve or disapprove of abortion under the following circumstances:

Interviewer: *Use the following codes to register the answer of the respondent:*
1=approve
2=disapprove
3=don't know

a. When the mothers health is at risk from the pregnancy I29a ☐

b. When the child is likely to be born physically handicapped I29b ☐

c. When the woman is not married I29c ☐

d. When the married couple does not want to have any more children I29d ☐

e. When the woman does not wish to have a child for the time being I29e ☐

f. When the woman became pregnant after being raped. I29f ☐

Interviewer:
Verify again (e.g. Module D, D12) whether this household is a fisherfolk household.

- *If a fisherfolk household* → GO TO MODULE J
- *If NOT a fisherfolk household* → END OF INDIVIDUAL INTERVIEW

Module J: Aquatic Resources and Coastal Environment

Interviewer:
This module is only for eligible male and female respondents in a FISHERFOLK HOUSEHOLD.

J1. I would like to know whether you agree or disagree with the following seven statements.

Interviewer: *Use the following answer categories and codes to register the answer of the respondent:*

1=Agree
2=Neither agree, nor disagree
3=Disagree
4=Don't know

Only use the option "don't know" after you really tried to make the respondent choose between the three options 1...3.

a. Over the last few years, the TOTAL CATCH has seriously declined because of an ever increasing number of fishermen and fishing boats. J1a ☐

b. Over the last few years, the VARIETY OF FISH caught has seriously decreased because of an ever increasing number of fishermen and fishing boats. J1b ☐

c. Over the last few years, the SIZE OF THE FISH caught has seriously decreased because of an ever increasing number of fishermen and fishing boats. J1c ☐

d. Over the last few years, the QUALITY OF THE SEA WATER has seriously deteriorated due to the inflow of industrial waste and/or sewage water and household waste and/or pollution by ships. J1d ☐

e. The Government has taken adequate steps for the CONSERVATION and PROTECTION of the FISHERIES RESOURCES in this region. J1e ☐

f. The Government has taken adequate steps for the CONSERVATION and PROTECTION of the COASTAL ENVIRONMENT in this region. J1f ☐

g. Strict regulations should be introduced to REGULATE THE TYPE OF FISHING GEAR to be operated on the various fishing grounds. J1g ☐

J2 According to you, should action be undertaken, irrespective by whom, to improve the fisheries in this region? J2 ☐

1. Yes → J2a What do you think is the most important action that should be undertaken to improve the fisheries in this region? (office) J2a ☐☐

Description of most important action:'.....
.....
.....

2. No

J3 Have you personally taken any steps to preserve or improve the fisheries resources and the coastal environment in this region? J3 ☐

1. Yes → J3a Could you give me the most important step that you have taken personally to improve the fisheries resources and the coastal environment in this region? (office) J3a ☐☐

Description of most important personal step:
.....
.....

2. No

END OF INDIVIDUAL QUESTIONNAIRE

Key-informant questionnaire (FPA/INT/287/FPA)

Community/Village profile

Country: Bangladesh

Interviewer: In case not all questions in this questionnaire can be answered by one key informant only, please obtain answers from other key informants.

District	.....	District ID number
Tana	.....	Tana ID number
Union	.....	Union ID number
Village	.....	Village ID number

Name Interviewer: .....

Date start of interview: Day ☐☐ Month ☐☐

Number of days it took to complete this questionnaire: ☐☐

Interviewer, please read out the following text to the key informant.

...I would like to ask you about site and situation characteristics of this community/village. All the information you give will be used for research purposes only. I would appreciate it very much if you would tell me as accurately as you can about the issues addressed below.....".

Interviewer:

1. *In the questions that follow we want to know , among others, about "distances". Indicate here whether distances are reported in kilometers (code 1) or in miles (code 2).* ⟶ Measure ☐
2. *If distance is less than 1 km or 1 mile then enter 00 in box.*
3. *Some question coding boxes are accompanied by the word "(office)". This means that you do not have to fill in a code. That will be done by coders and editors in the office.*

Identity of key informant(s)	Name	Age	Sex 1=male 2=female	Description of position held (*)	(office) Position Code
Key informant 1	.....	☐☐	☐	.....	☐☐
Key informant 2	.....	☐☐	☐	.....	☐☐
Key informant 3	.....	☐☐	☐	.....	☐☐
Key informant 4	.....	☐☐	☐	.....	☐☐

(*) **Interviewer:** *describe position held by key-informant, such as: e.g. village chief/leader, schoolmaster, religious leader, local factory owner, village doctor.*

Location/situation of the community/village

K1 What is the name of the nearest urban center?

Name: .....

(office) K1 ☐☐

K2 What is the distance to the nearest urban center? K2 ☐☐☐

K3 **Interviewer:** *Register whether the community/village is situated on:*

1. Flat land
2. Plateau
3. Slope of a hill

K3 ☐

K4 Nearby what kind of site is the community/village located?
Interviewer: *enter code 1 if "yes", code 2 if "no".*

a. Sea/Estuary	K4a ☐
b. Lake	K4b ☐
c. River	K4c ☐
d. Forest	K4d ☐
e. Industrial site	K4e ☐
f. Waste land	K4f ☐
g. Wet-land/swamp	K4g ☐
h. Other, specify:.....	K4h ☐

K5 What is the most commonly used type of transportation to go to the nearest urban center?

1. On foot
2. Donkey, horse, etc.
3. Bicycle
4. Cart, wagon (e.g. ox-cart)
5. Motorcycle, car
6. Bus, or other public transport

K5 ☐

K6 What is the main access route to this community/village?

1. All weather road
2. Seasonal road
3. Trail/path/alley
4. River/canal
5. Other, specify:.....

K6 ☐

K7 What would you say is the main economic activity of inhabitants in this village?

1. Agricultural
2. Fish catching/Aquaculture
3. Fish processing and/or fish marketing
4. Trading/ marketing of non-fish products
5. Manufacturing
6. Mining
7. Livestock
8. Hunting
9. Forestry
10. Other, specify:.....

K7 ☐☐

K8 What would you say are the second (K8a) and third (K8b) most important economic activities of inhabitants in this village?

1. Agricultural
2. Fish catching/Aquaculture
3. Fish processing and/or fish marketing
4. Trading/ marketing of non-fish products
5. Manufacturing
6. Mining
7. Livestock
8. Hunting
9. Forestry
10. Other (1), specify:.....
11. Other (2), specify:.....

K8a ☐☐
K8b ☐☐

K9 What is the main method of waste disposal in this community/village?

1. Pit, inside compound
2. Pit, outside compound
3. Roadside
4. Nearby in sea, lake, river
5. Burned somewhere in village
6. Other, specify.....

K9 ☐☐

K10. Now I would like to ask you about the distances to various types of SCHOOLS, how one usually goes there and how long it takes to get there from the main community/village center.

Type of school	K10a Distance	K10b Most common transport *(use codes in K5)*	How long to get there from here K10c *hrs*	K10d *min.*
a.Elementary school	☐☐	☐	☐☐	☐☐
b.Secondary school	☐☐	☐	☐☐	☐☐
c.College/university	☐☐	☐	☐☐	☐☐
d.Adult Literacy Classes	☐☐	☐	☐☐	☐☐

K11 I would like to ask you about the distances to various types of GENERAL SERVICES, how one usually goes there and how long it takes to get there from the main community/village center.

Type of general service	K11a Distance	K11b Most common transport *(use codes in K5)*	How long to get there from here K11c *hrs*	K11d *min.*
a. Post office/mail service	☐☐	☐	☐☐	☐☐
b. Market in village	☐☐	☐	☐☐	☐☐
c. Bus stop/station	☐☐	☐	☐☐	☐☐

K12 Now I would like to ask you about the NEAREST HEALTH SERVICES, that is, about the travel distances to these health services, how one usually goes there and how long it takes to get there from the main community/village center.

Type of health service	K12a Distance	K12b Most common transport *(use codes in K5)*	How long to get there from here K12c *hrs*	K12d *min.*
a. Hospital	☐☐	☐	☐☐	☐☐
b. Public Health clinic/center	☐☐	☐	☐☐	☐☐
c. Local MCH/FP Clinic	☐☐	☐	☐☐	☐☐
d. Medical Doctor	☐☐	☐	☐☐	☐☐
e. Pharmacy/dispensary	☐☐	☐	☐☐	☐☐
f. Nurse/Midwife	☐☐	☐	☐☐	☐☐
g.Traditional Healer	☐☐	☐	☐☐	☐☐
h. Traditional Birth Attendant	☐☐	☐	☐☐	☐☐

K13 Can you obtain any of the following services in any of the health service institutions listed in K12a-K12h?

Interviewer: *enter code 1 if "yes", code 2 if "no". Only use code 8 (=don't know) if you did not succeed in probing for a "yes" or "no" answer.*

a. Prenatal care	K13a	☐
b. Delivery care	K13b	☐
c. Child immunization	K13c	☐
d. Postnatal care	K13d	☐
e. Family planning services → ***if K13e= 2 (i.e. no) , go to K15***	K13e	☐

K14 Can you obtain any of the following MODERN family planning methods from any of the institutions listed in K12a-K12h?

Interviewer: *enter code 1 if "yes", code 2 if "no". Only use code 8 (=don't know) if you did not succeed in probing for a "yes" or "no" answer.*

a. Pill	K14a	☐
b. IUD	K14b	☐
c. Diaphragm	K14c	☐
d. Foam, jelly or cream	K14d	☐
e. Injections	K14e	☐
f. Condom	K14f	☐
g. Female sterilization	K14g	☐
h. Male sterilization	K14h	☐

K15 Are TRADITIONAL family planning methods used to avoid pregnancy in this community/village, such as: periodic abstinence, post-partum abstinence, use of herbs? K15 ☐

1. Yes → K16
2. No

K16 Could you mention the two most popular traditional methods used by members of this community and indicate (K16b) whether the method is used by males (1), females (2) or by both (3)?

	K16a Description	K16b Sex	(Office) K16c Code
Method 1	.....	☐	☐
Method 2	.....	☐	☐

K17 The proportion of inhabitants in this village that use traditional methods is: K17 ☐

1. Half or more
2. One tenth to half
3. Less than one tenth

Population and other characteristics

K18 Is this community/village part of a city, town, rural area or is it a community/village on it's own? K18 ☐

1. City
2. Town
3. Rural area
4. Community/village on it's own

K19 What is the approximate number of inhabitants in this community/village? K19

K19a What is the approximate number of residences/houses in this community/village? K19a

K20 Can you give me an estimate of the proportion of marriages or liaisons that are polygamous ? (one man married to more than one woman)? K20

1. Half or more
2. One tenth to half
3. Less then one tenth
4. Not practiced here

Community/village institutions

K21 Could you tell me which main institutions/organizations are present in this community/village and give me an estimate of the number of members of these institutions (e.g. fisherman's organization, political party, women's club etc.)?

	K21a Description of main institutions in community/village	K21b Number of Members	K21c (office) Code for this institution
a.	.....		
b.	.....		
c.	.....		
d.	.....		
e.	.....		
f.	.....		

K22 Is there a community center where the inhabitants of this community/village gather and exchange opinions? K22

1. Yes
2. No

K23 Are non-formal educational programmes organized in this community/village? K23

1. Yes → K23a Any of the following educational programmes?
   Interviewer: *Code 1=yes, 2=no, 3= don't know*
   - a. Literacy classes K23aa
   - b. Vocational or technical training courses K23ab
   - c. Family planning/Population education K23ac
   - d. Other, specify:..... K23ad
2. No

Communication and Information

K24 Which newspapers can be obtained in this community/village? Please give names of the main newspapers and an indication of their DISTRIBUTION and over which TIME INTERVAL new editions can be obtained here.

Interviewer:

CODES for DISTRIBUTION: 1=local, 2=district/regional, 3=national.

CODES for TIME INTERVAL: 1=daily, 2=weekly, 3=monthly, 4=irregular, 5=other.

K24 (cont'd.)

Name of newspaper

		K24a Distrib.	K24b Timing
a.	→	☐	☐
b.	→	☐	☐
c.	→	☐	☐
d.	→	☐	☐

K25 Could you give me an estimate of the proportion of inhabitants that read newspapers or magazines in this community/village?

1. Half or more
2. One tenth to half
3. Less than one tenth
4. No newspapers or magazines in this community/village

K25 ☐

K26 Could you give me an estimate of the proportion of inhabitants that have a radio in this community/village?

1. Half or more
2. One tenth to half
3. Less than one tenth
4. No radio's in this community/village

K26 ☐

K27 Could you give me an estimate of the proportion of inhabitants that have a TV in this community/village?

1. Half or more
2. One tenth to half
3. Less than one tenth
4. No TV sets in this community/village

K27 ☐

Religious activities

K28 About how often are major religious ceremonies/feast organized in this community/village?

1. Once a year
2. Once a month
3. Once a week
4. Every day
5. Never

K28 ☐

K29 What are the main religions practiced by the population in this community? Could you also indicate which percentage of the population adheres to that religion?

Interviewer: *For each religion, enter code 1 if religion is practiced, code 2 if not practiced and code 8 if key-informant does not know.*

a. Buddhism	K29a ☐
b. Christian	K29b ☐
c. Muslim	K29c ☐
d. Hindu	K29d ☐
e. Other; specify:.....	K29e ☐

Political participation Page 7

K30 Could you give me an estimate about what proportion of the total population in this community/village is member of a political party?

1. Half or more
2. One tenth to half
3. Less than one tenth
4. Nobody

K30 ☐

Specific Questions about economic activities

Interviewer: Verify the answers on K7 and K8. If fish catching, aquaculture, fish processing and/or fish marketing were recorded as major economic activities in this community/village, then go to K31. If this is not so, skip to question K34.

K31 Can you give me an estimate of the number of households in this community who are during most of their time engaged in fishing and generate most of their income from it?

1. Half or more (=>50%)
2. One tenth to half (10%-49%)
3. Less than one tenth (<10%)

K31 ☐

K32 Can you describe the three most important types of fishing methods used?

Describe fishing method	(office)
a.	K32a ☐☐
b.	K32b ☐☐
c.	K32c ☐☐

K33. Can you tell me about the degree of exploitation of the fisheries resources in your neighbourhood. Are they overexploited, under exploited or fully exploited?

Interviewer:

Code 1= Overexploited, 2=Under-exploited, 3=Fully exploited. Use code 8 if key informant(s) does (do) not know.

a. Pelagic fisheries K33a ☐
b. Demersal fisheries K33b ☐
c. Inshore K33c ☐
d. Offshore K33d ☐

K34. Now we would like to know which months belong to the fishing season.

Interviewer:

For each month listed below, enter code 1 if the month belongs to the fishing season or enter code 2, if the month does not belong to the fishing season.

	K34		K34		K34		K34
a. January	☐	d. April	☐	g. July	☐	j. October	☐
b. February	☐	e. May	☐	h. August	☐	k. November	☐
c. March	☐	f. June	☐	i. September	☐	l. December	☐

K35. Could you tell me whether WOMEN in this village carry out the activities that I read to you. I would also like to know whether these activities are carried out within the vicinity of the home, elsewhere in the village or outside the village.

Interviewer: You must fill in all boxes below with codes. Code 1=yes, 2=no, 8=don't know.

Activities of women	K35a Within or near the home	Away from the home K35b inside village	Away from the home K35c outside village
a. Processing/marketing of fish	☐	☐	☐
b. Agriculture	☐	☐	☐
c. Vegetable gardening/horticulture	☐	☐	☐
d. Cattle raising/herding	☐	☐	☐
e. Retail business/small scale family enterprise	☐	☐	☐
f. Wage and salaried employment	☐	☐	☐
g. Capture/culture of aquatic organisms and and related activities.	☐	☐	☐
h. Domestic work in combination with any activity listed under a.-g.	☐	☐	☐
i. Domestic work only	☐	☐	☐

History of the community/village

K36. When was this community established/founded? K36 ☐

1. Less than 1 year ago
2. 1-4 years ago
3. 5-19 years ago
4. 20-49 years ago
5. 50 years ago, or longer

K37. Have occupations and economic activities changed in this community/village in the last 10-15 years? K37 ☐

1. Yes → K38. Can you describe the most important change that took place? (office) K38 ☐☐
   .....
   .....
2. No

↓

K39. Can you describe the main reason for this change? (office) K39 ☐☐
.....
.....

↓

K40. Did this change result in any major in- or out migration

Interviewer: *Enter code 1 if "yes", code 2 if "no", code 8 if "don't know".*

a. Major Emigration K40a ☐
b. Major Immigration K40b ☐

K41. Did this community/village have any important conflicts with (a) neighbouring communitie(s)/village(s) in recent years? K41 ☐

1. Yes → K42. What was the major reason for this? (office) K42 ☐
   .....
   .....
2. No

↓

END OF INTERVIEW

ANNEX 3

Sampling guidelines

In countries where sampling frames of fishing communities at the district or province-level were available or could be created at low cost, FAO asked the national project directors to develop probability sample designs. The objective was to sample five percent – at least five coastal fishing communities – from a sampling frame consisting of fishing communities in a particular district or province. Adjacent to each sampled fishing community, a nearby agricultural community would be identified and selected. Depending on the size of the selected communities, about 5-10 percent – at least 100 households were to be sampled.

Consequently, information obtained from a probability sample survey of households in fishing communities was representative of all fishing community households in the particular district or province. However, the above-mentioned selection method implies that results obtained from households in agricultural communities would not be representative for households in all the agricultural communities in that same district or province. Nevertheless, this was not considered significant as the reason for including agricultural communities was solely to obtain survey data from a comparison group of households living in the same environment, but with livelihoods unrelated to fisheries.

Guidelines for the sampling of fishing communities and households within fishing communities entailed sampling procedures for simple two-stage self-weighting sample designs. Self-weighting designs were proposed to avoid the computation and use of sample-design weights in the survey analysis stage. In a self-weighting design, the selection procedures were such that households that were in the sample had the same overall (i.e. ex-post) selection probability, irrespective of the number of households in the communities from which households were sampled. The guidelines proposed two model sample designs:

1) If a district- or province-level sampling frame could inexpensively include current population estimates for fishing communities, five or more communities could be sampled with probabilities proportional to the population (PPS) of communities in the sampling frame. This would be accomplished by applying the systematic selection method to a geographically sorted list of communities with reported cumulative population estimates for each village. Often the population of a community was unknown, because village census registers did not exist or were out of date. In that case, the last existing population census was chosen and the selection of communities was in proportion to their estimated population size (PPES). In the second stage, a fixed number of households (say 20) was selected in sampled communities, after the communities were screened, for the total number and location of households. If the proportionate distribution of population of sampled communities at the time of the last census was found to differ significantly from the proportionate population distribution derived from the screening of the sampled communities at the time of the survey, this difference was taken into account to correct the initial selection probabilities. The PPES sampling strategy results in a self-weighting design whereby the overall selection probabilities of households are the same, irrespective of the size of the community from which they come..

2) If a district- or province-level sampling frame existed with only the names of fishing communities but without their population size estimates, a somewhat different approach, though self-weighting, was followed: In the first stage, a fixed number of five fishing communities was sampled from the sampling frame of households with the help of a random number table. In the

second stage, contact was made with the administration in the selected communities to obtain the total number of households in the community and their location. If such information was not available, a screening census was carried out in the communities to create a sampling frame of households. A fixed percentage of households was selected in the selected fishing communities. Although this method is easier to apply than the first, the disadvantage is that there is no a priori control over total sample size, because the number of households in the communities differ.

In country-specific studies, small sample size has analytical implications because statistically meaningful generalizations at the level of the district or province cannot really be made. In addition, limitations are posed on the kind of research questions that can be answered, particularly those that require creation and interpretation of multi-dimensional tabulations. Such tabulations will produce a number of empty cells and/or cells containing a fewnumber of cases only. Moreover, because the magnitude of variance estimates of averages and proportions is inversely related to sample size, the smaller the sample size, the higher the probability to make so-called "errors of omission" (i.e. Type-2 errors). That is, the error or failure to uncover significant variables, relations and true differences between groups of interest. As far as issues covered by the focus group discussions in the areas studied overlap with those of the household survey, the negative consequences of such errors can to some extent be minimized.

The above-mentioned analytical restrictions owing to small sample size become less significant when survey data feature in research questions involving comparative analyses across countries, in search of common features, differences and patterns of change between fisherfolk and other rural dwellers.

ANNEX 4

Focus group discussions

A. Selection of groups for group discussions and individuals for semi-structured interviews.

In each village, four groups were formed according to age and sex criteria:

- men of about 55 years;
- women of about 55 years;
- men of about 25 years;
- women of about 25 years.

In each group, focus group discussions were carried out following a semi-structured interview schedule, described below.

B. Topics covered by focus group discussions (FGD) and individual interviews in fishing and farming villages.

B.1. Subjects covered in fishing villages.

- **Changes in the geographic distribution and demographic situation of fisherfolk and their socioeconomic status over the past 20 years.**

  A selected number of fisherfolk were asked to assess, according to their knowledge and awareness, how their personal lives and the lives of other fisherfolk in their area had changed over the past 20 years with regard to: the number of fishers in the area;, the growth of their population; the extent of immigration and emigration in the communities; socioeconomic status; etc.. The assessment had to include an account of negative as well as positive changes.

  Regarding socioeconomic status the following issues were assessed: ownership of main production factors, level and distribution of income, access to alternative income-earning activities, quality of housing, physical and social infrastructure and services, including health care and nutrition, family size and structure, preferred and actual age, contraceptive use, political participation and decision making at district/regional/village/household level, division of labour by gender and other issues were also addressed.

- **Changes in the number, type and quality of fishing gear, fish catches and fish-marketing over the past 20 years**

  The objective was to assess, as remembered by the fishers, what the changes were in the types of fishing craft and gear used in the past 20 years and how the number of fishing craft and gear changed during that period. Moreover, what were the reasons for the above changes according to fisherfolk? What were the changes in the species caught and what were the changes in the quantities caught? What were the changes in production costs and income of fishers and fish prices paid to fishers?

- **Changes in the level of exploitation of coastal resources, including fish resources and in the state of the coastal environment over the past 20 years.**

  The subject was to assess perceived changes in and underlying reasons of the level of exploitation of coastal resources, the fisheries and the state of the coastal environment.

Moreover, opinions on what local and national governments should and could do to control and sustain the coastal environment and fisheries resources.

B.2. Subjects covered in both fishing and farming villages.

- **Changes in perceptions regarding marriage, numbers of children and general social values and perspectives/outlook over the past 20 years.**

  Focus group members discussed about fertility related issues such as: changes in actual and perceived ideal age at marriage for men and women, actual and ideal number of children to have, attitudes and practice of modern and traditional family planning; changes in personal ambitions and prospects.

- **Changes in main occupations and occupational and socioeconomic status over the past 20 years.**

  Group members assessed change in general economic and social development and needs at the level of the community and households, including constraints as perceived by discussion group members. Moreover, the perceived changes in, reasons for and change in main occupations of household- members were assessed.

An increase in the number of fishers as a result of population growth and migration to coastal fishing communities can be a contributing factor in the overexploitation of fisheries resources and the deterioration of the coastal environment. The findings of the UNFPA-FAO project, "Strengthening of research and training on population and development dynamics of rural fishing communities" suggest that contrary to the assumed global trend, the number of coastal fishers has started to decline or stagnate in recent years in some developing countries. The findings further suggest that artisanal fisheries no longer are a "last resort employment" for people in some coastal areas.

Access to alternative employment opportunities and occupational mobility because of higher levels of education and general economic development as well as government policies aiming to reduce fishing effort and conserve the coastal environment are among the reasons that have contributed to the change. Moreover, contrary to other reports, levels of fertility and infant mortality in fishing communities have been found to be not much higher than those in farming communities.

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